„Gas Touch“

Built-in Gas Hobs with Electronic Control and Touch User Interface

ESSE-N / A.S.

February 2005

Electrolux

General Features

- built-in „gas-on-glass“ hob, 73 x 51 cm
- tempered glass surface (8 mm thickness)
- standard Electrolux components:
  - 4 gas burners: 1 rapid / 2 semirapid / 1 auxiliary
  - ignition unit (spark generator)
  - spark plugs
  - flame detector thermocouples

General Features

- Electronic control system (supplier: SIT)
- Power board
- Touch-control user interface
  - L.H. user interface controlling 2 L.H. burners
  - R.H. user interface consisting of:
    user interface controlling 2 R.H. burners
    main ON/OFF and timer board
- Main shut-off valve
- Modulation valves for each burner

Safety Features

Electrolux

- Child lock
- Automatic shut-off :
  - time-controlled
  - temperature-controlled

Battery Kit

- A kit with a rechargeable battery will be available as a service part, to be fitted in areas with power supply problems
- The battery offers a backup power supply to bridge a short mains power failure

Brands / Models / Countries

Electrolux

Electrolux

▪ EHS 740 K	pnc 949 750 638	ES	cat. II_{2H3+}
▪ EHS 742 K	pnc 949 750 637	GB, IE	cat. II_{2H3+}
▪ EHS 746 K	pnc 949 750 639	HU	cat. $II_{2HS3B/P}$
▪ EHS 746 K	pnc 949 750 640	CZ, HR, SI, SK	cat. II_{2H3+}
▪ EHS 74 K	pnc 949 750 641	SE, TR	cat. $II_{2H3B/P}$

Brands / Models / Countries

Electrolux

AEG

Electrolux

79900 G-m	pnc 949 750 626	IT, PT	cat. II_{2H3+}
79901 G-m	pnc 949 750 628	FR	cat. II_{2E+3+}
79902 G-m	pnc 949 750 629	BE	cat. II_{2E+3+}
79903 G-m	pnc 949 750 627	GB, IE	cat. II_{2H3+}
79904 G-m	pnc 949 750 631	NL	cat. $II_{2L3B/P}$
79905 G-m	pnc 949 750 630	DK, NO	cat. $II_{2H3B/P}$

Brands / Models / Countries

Electrolux

ZANUSSI

- ZGG 742 EX pnc 949 750 636 GB, IE cat. II_{2H3+}
- ZGG 743 EX pnc 949 750 647 BE cat. II_{2E+3+}

Brands / Models / Countries

Electrolux

ARTHUR MARTIN

Electrolux

- **TGE 7096 N pnc 949 750 634 FR cat. II_{2E+3+}**

Brands / Models / Countries

Electrolux

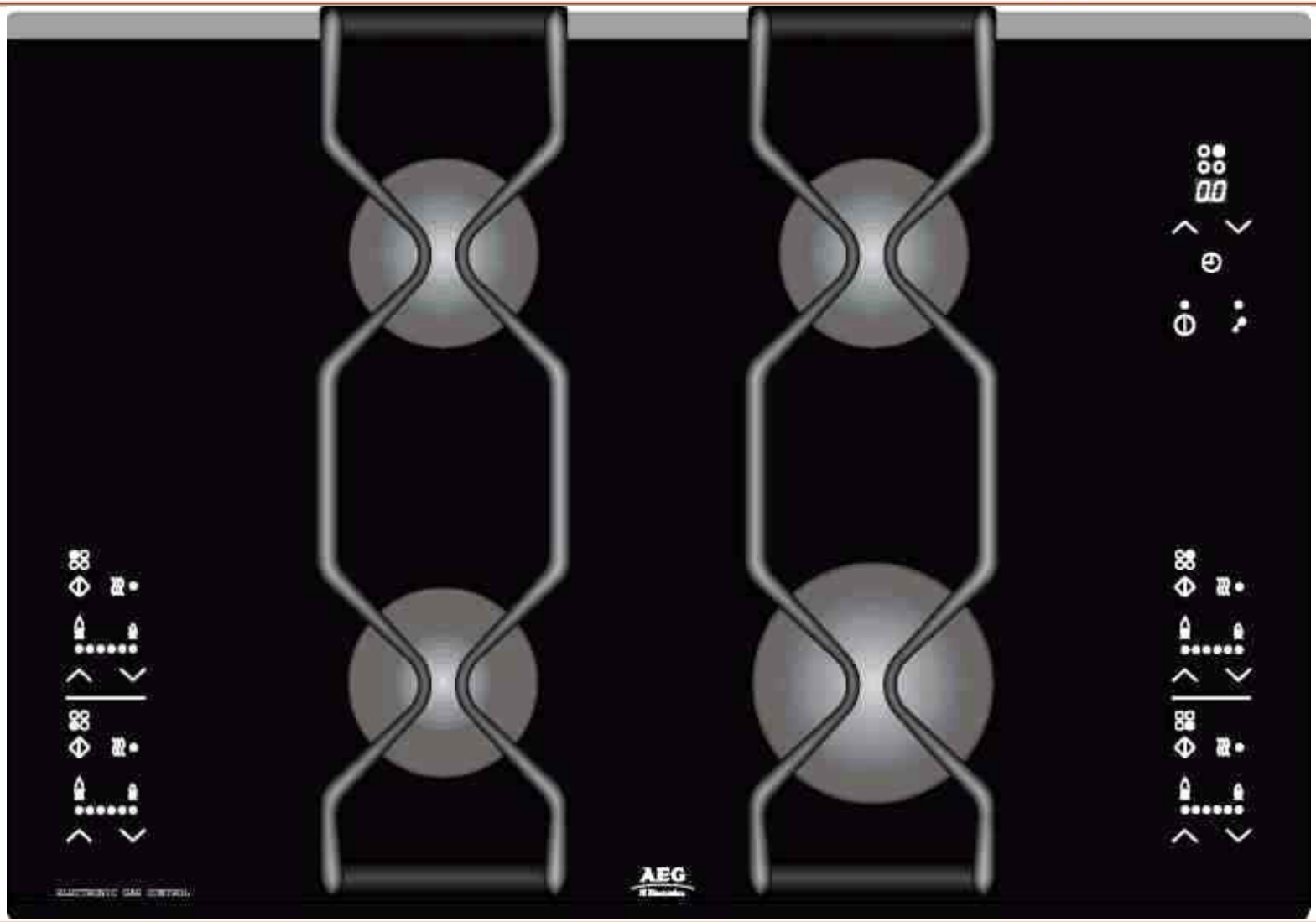
REX

Electrolux

- **PVN 74 XE pnc 949 750 632 IT cat. II_{2H3+}**

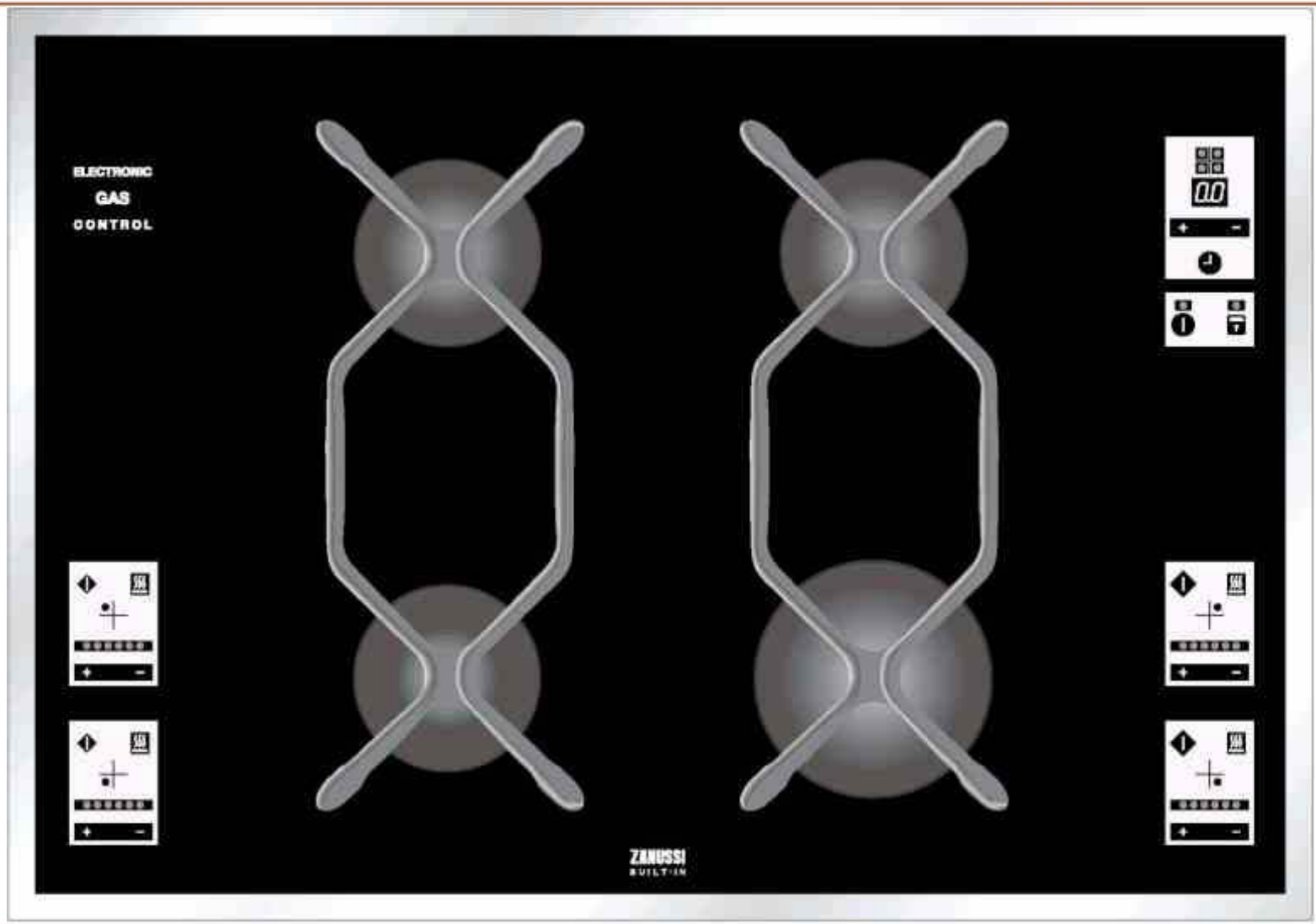
Aesthetics
AEG-Electrolux

Electrolux



Aesthetics : Electrolux, Zanussi, Rex-Electrolux

Electrolux



Aesthetics :
Arthur Martin Electrolux

Countries / Gas Categories

Electrolux

II_{2H3+}

Countries: CZ, ES, GB, HR, IE, IT, PT, SI, SK

- **2H → G20 at 20 mbar**
- **3+ → G30 at 28-30 mbar**
  or
  G31 at 37 mbar

Countries / Gas Categories

Electrolux

II_{2E+3+}

Countries: BE, FR

- **2E+ → G20 at 20 mbar**
  or
  G25 at 25 mbar
- **3+ → G30 at 28-30 mbar**
  or
  G31 at 37 mbar

Countries / Gas Categories

Electrolux

$II_{2H3B/P}$

Countries: SE, NO, DK, TR

- **2H → G20 at 20 mbar**
- **3B/P → G30 or G31 at 30 mbar**

Countries / Gas Categories

Electrolux

$II_{2L3B/P}$

Countries: NL

- **2L → G25 at 25 mbar**
- **3B/P → G30 or G31 at 30 mbar**

Countries / Gas Categories

Electrolux

$II_{2HS3B/P}$

Countries: HU

- **2HS → G20 at 25 mbar**
  or
  G25.1 at 25 mbar
- **3B/P → G30 or G31 at 30 mbar**

Test Gasses for Normal Operation

Electrolux

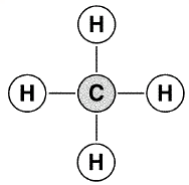
Gasses indicated on rating labels and in specifications are test gasses for normal operation in accordance with EN 437

- **2nd Family : natural gas**
  Group H: G20 = CH_4 100%
  Group L: G25 = CH_4 86% + N_2 14%
  Group S: G25.1 = CH_4 86% + CO_2 14% (only Hungary)
- **3rd Family : LPG**
  Group B: G30 = n-C_4H_{10} 50%, i-C_4H_{10} 50%
  Group P: G31 = C_3H_8 100%

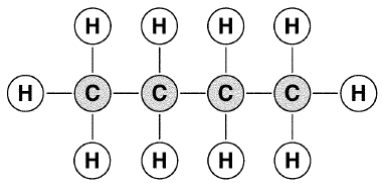
„Real“ gasses will be slightly different

Gasses

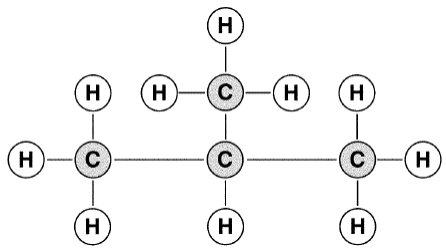
- CH_4 methane



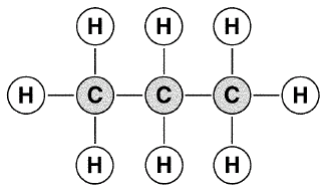
- **n-C_4H_{10} butane**



- **i-C_4H_{10}** isobutane



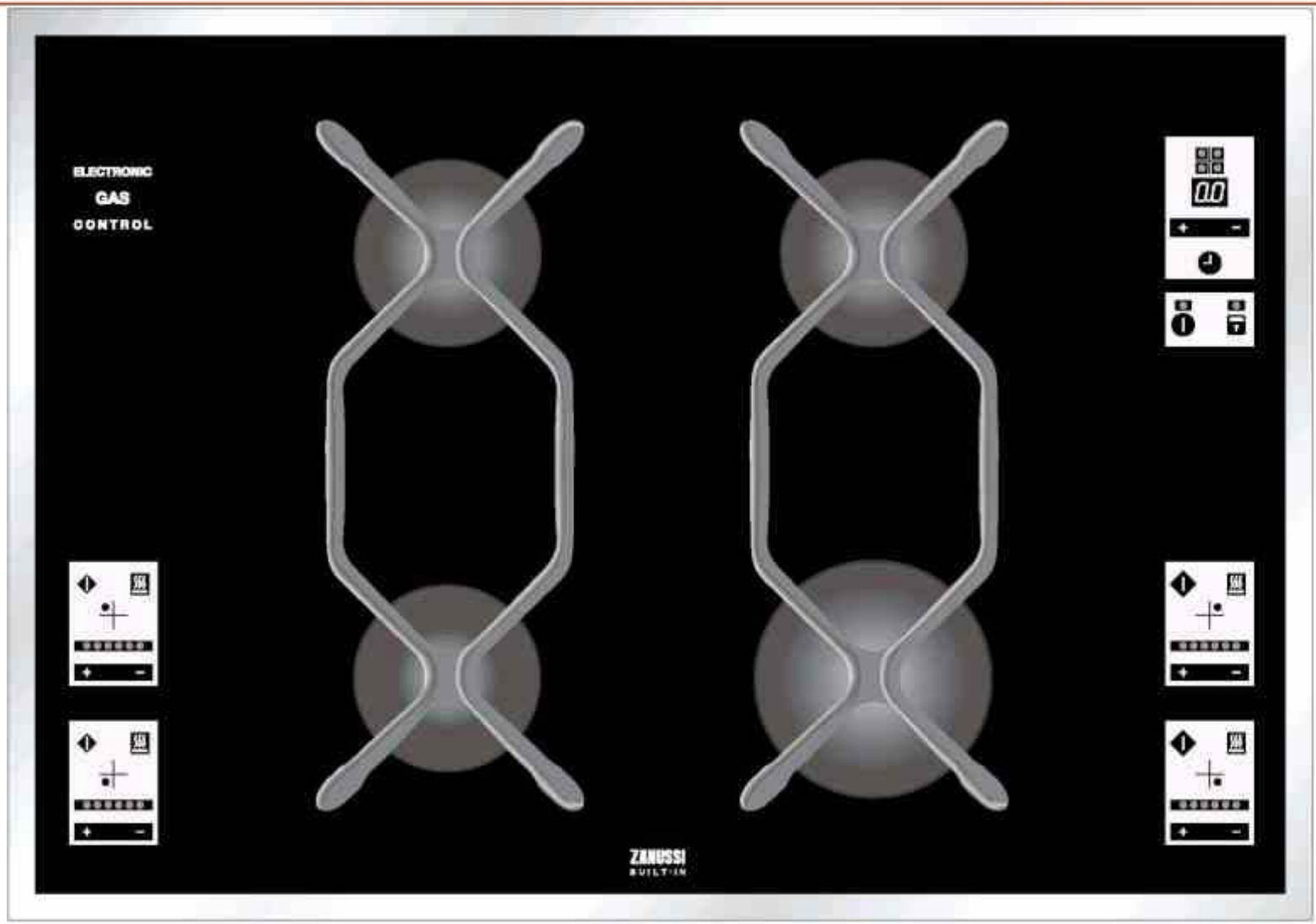
- **C_3H_8 propane**



- CO_2 carbon dioxide
- **N_2 nitrogen**

Hob Top

Electrolux



Component Layout

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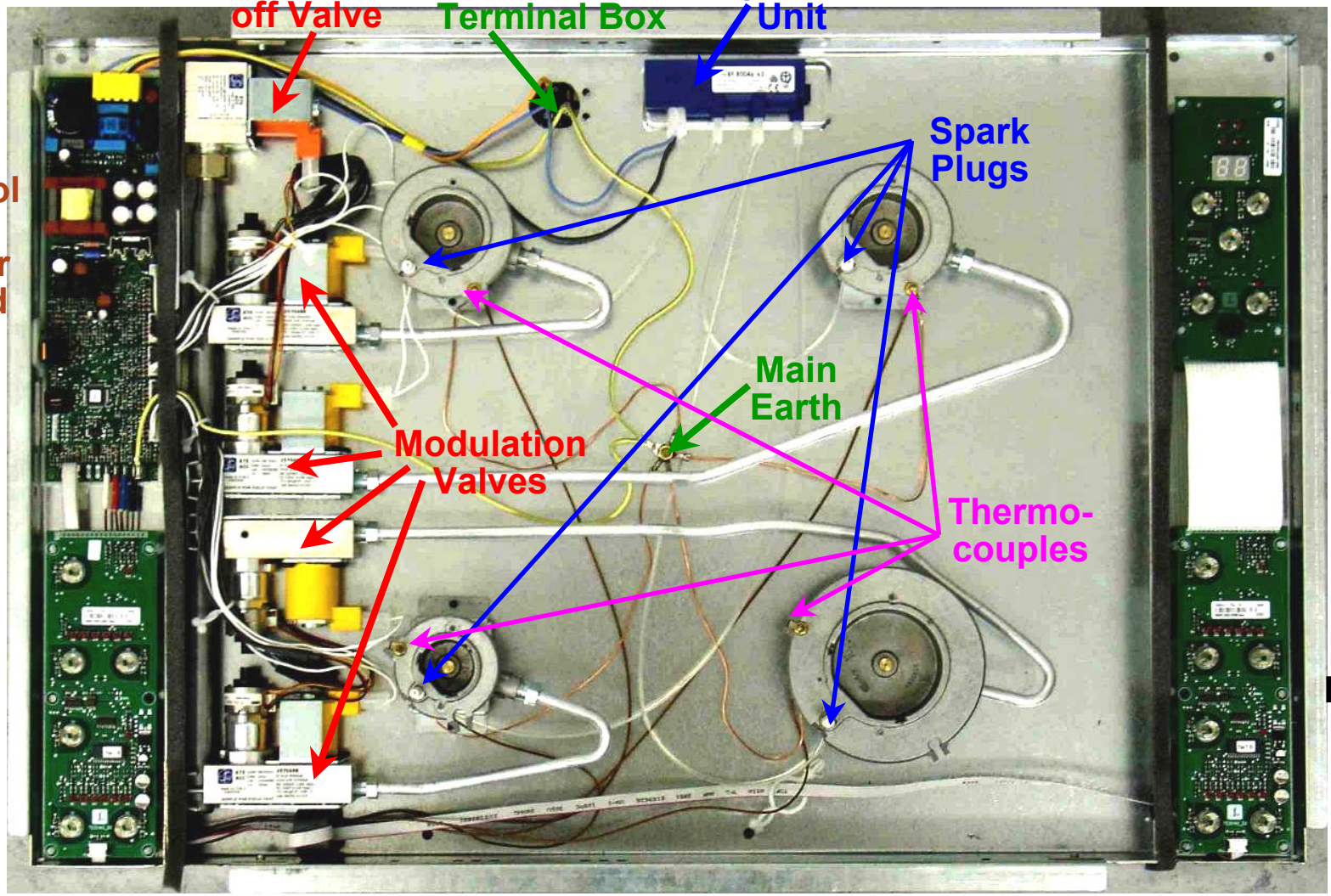


Main Control & Power Board

L.H. User Inter-face

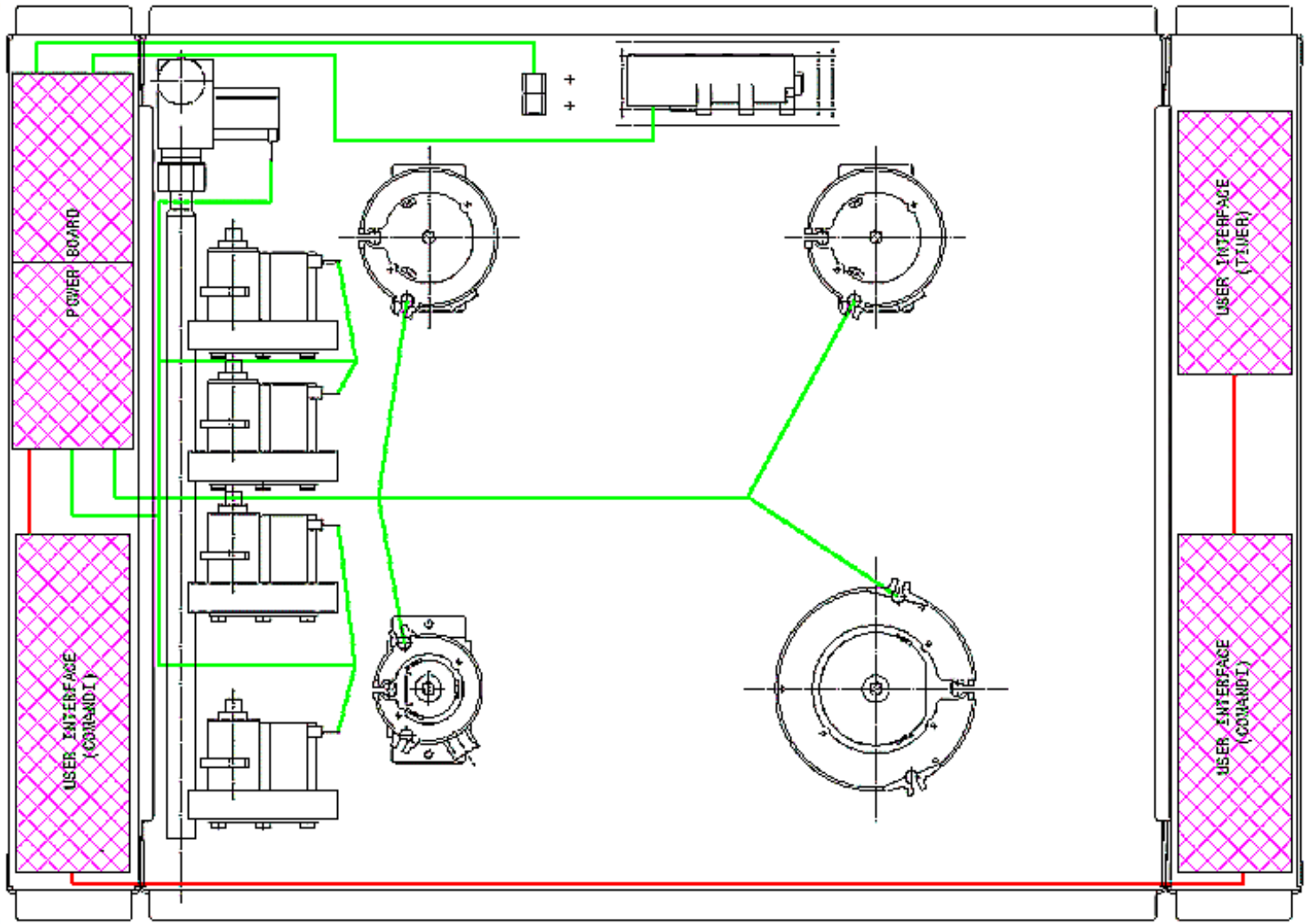
R.H. User Inter-face:

ON / OFF + Timer

R.H. Burner UI

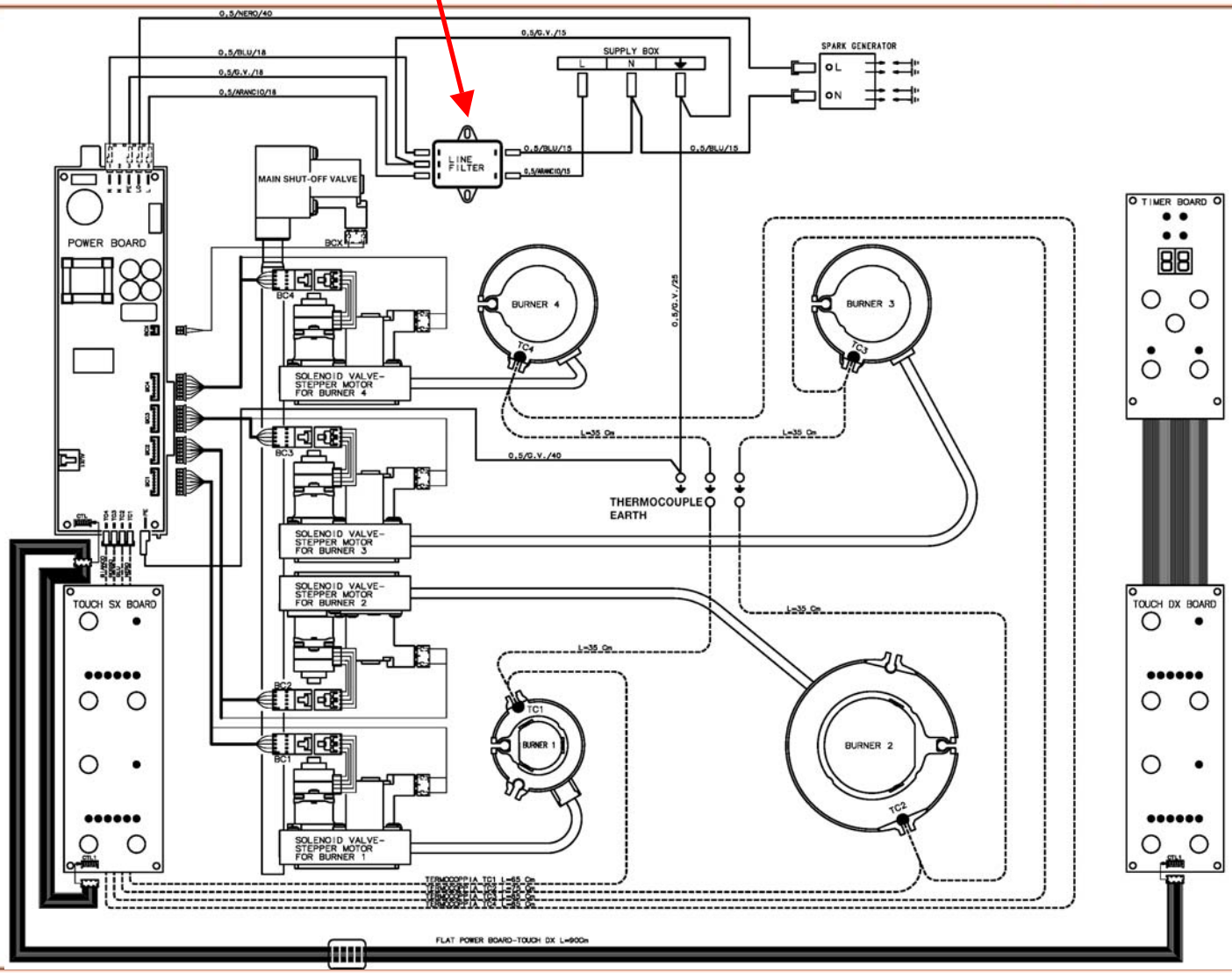
Schematic Layout

Electrolux



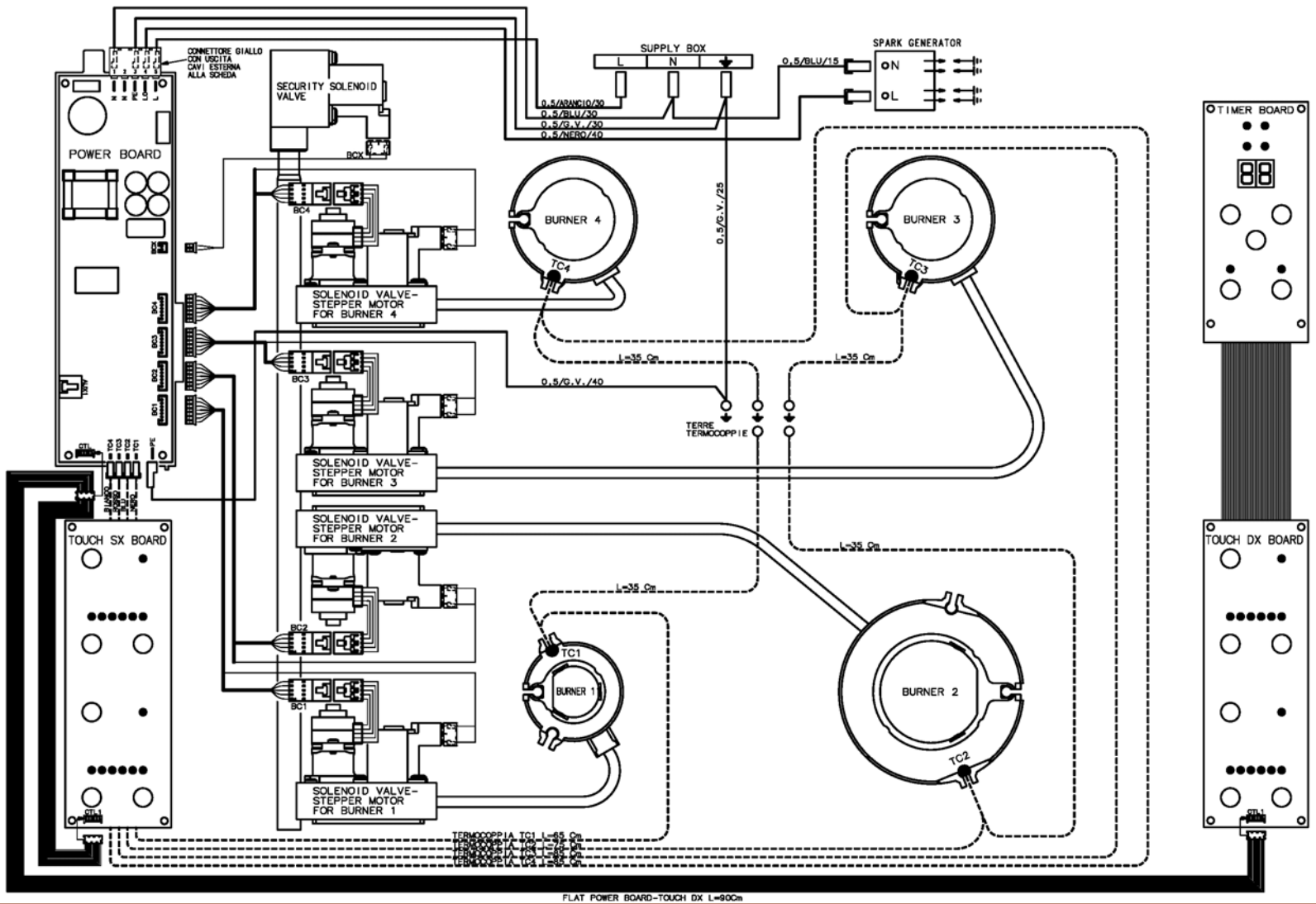
Gas Touch Wiring 1
With EMC Filter

Electrolux



Gas Touch Wiring 2
Without EMC Filter

Electrolux



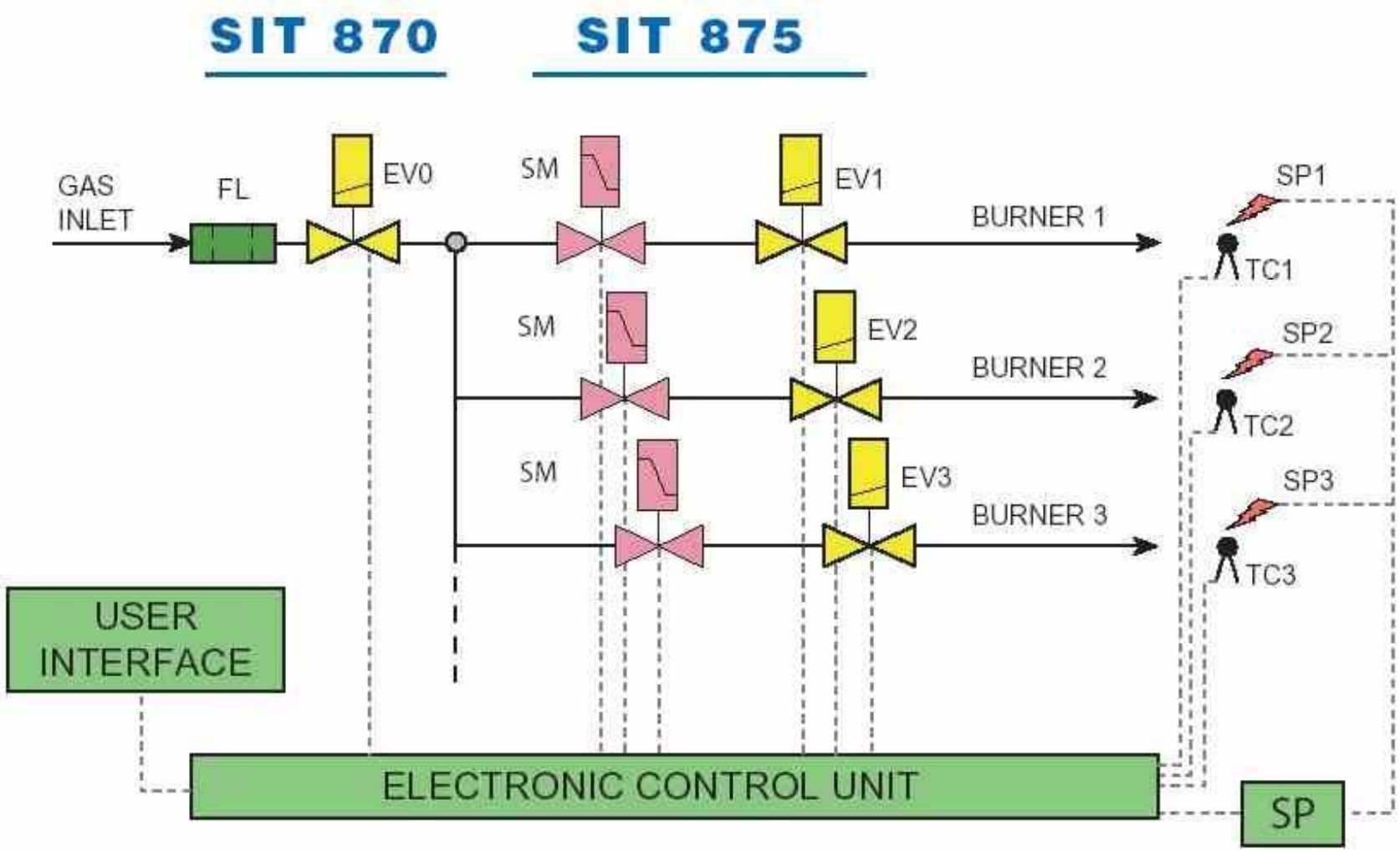
Gas Touch Wiring

Electrolux

- Initial production wiring will have an EMC filter between terminal box and main board
- Main board will be modified by mid-2005 for RoHS compliance; this modified board will also comply with EMC regulations without the need of a filter (to be confirmed)
- The allowed leak current will not be exceeded if this board is used as service replacement on an older hob having the filter

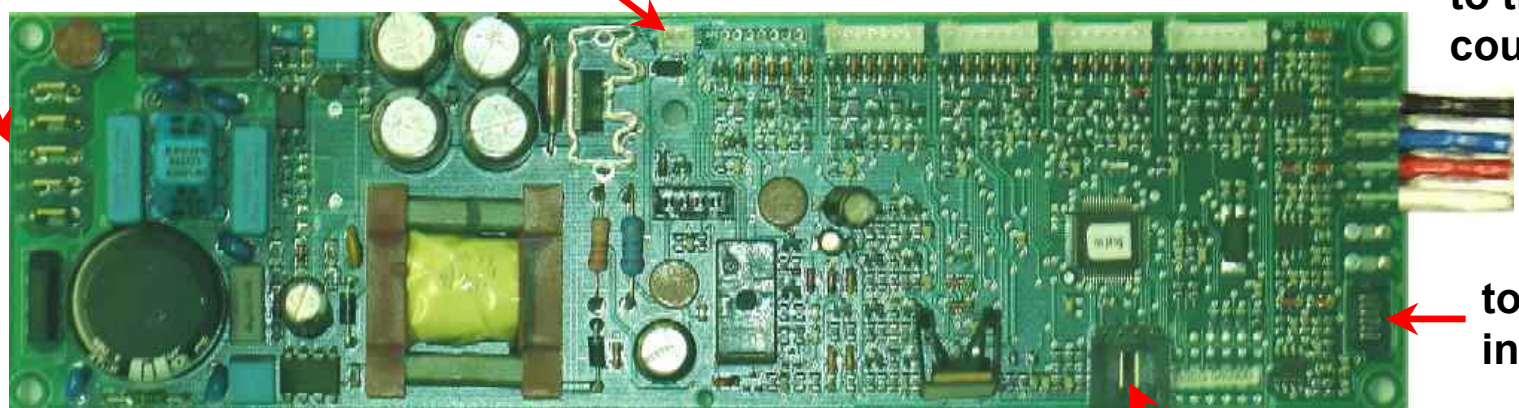
Gas Control Schematic

Electrolux



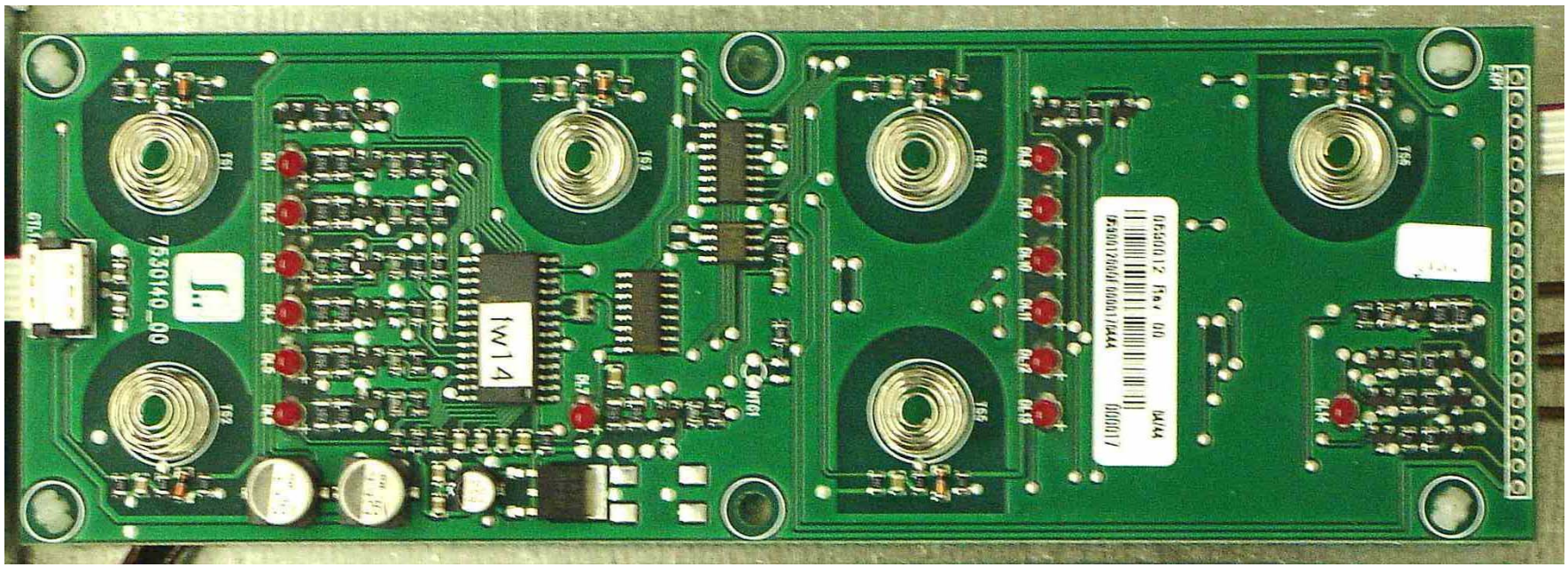
Power Board

Electrolux



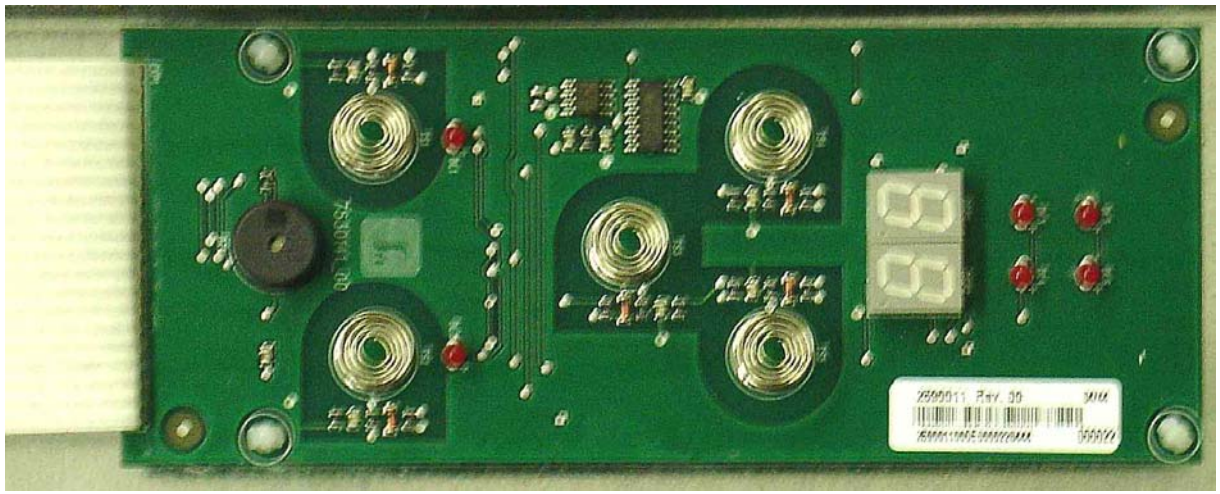
User Interface L.H.

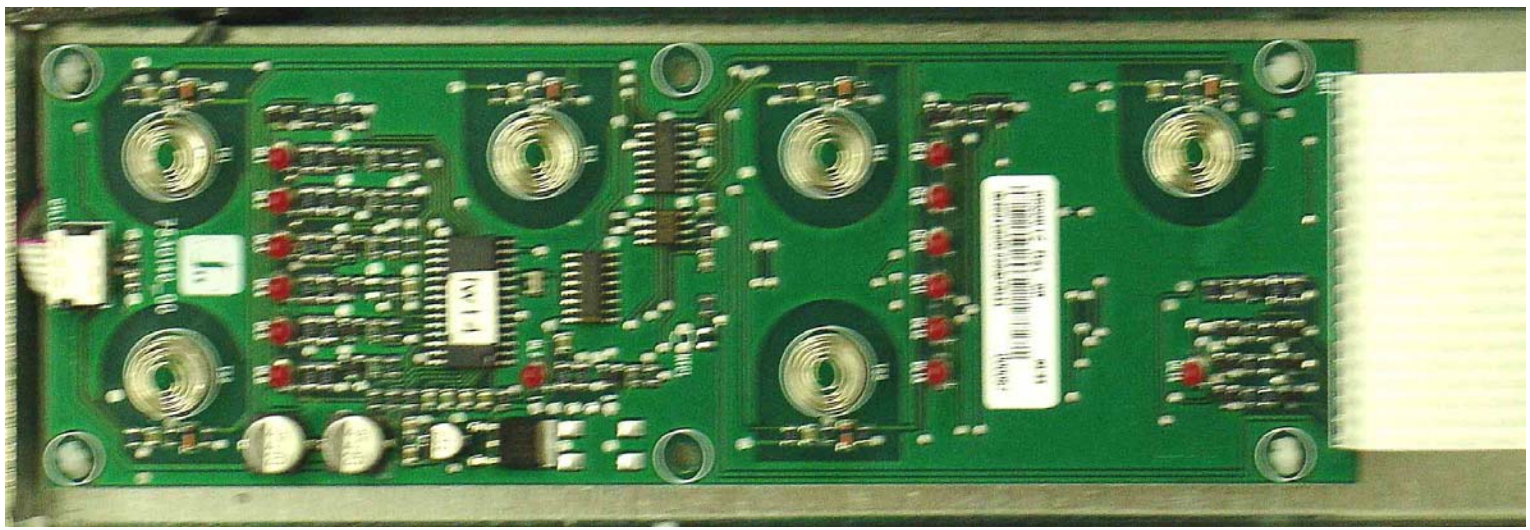
Electrolux



User Interface R.H.

Electrolux





Main Shut-off Valve

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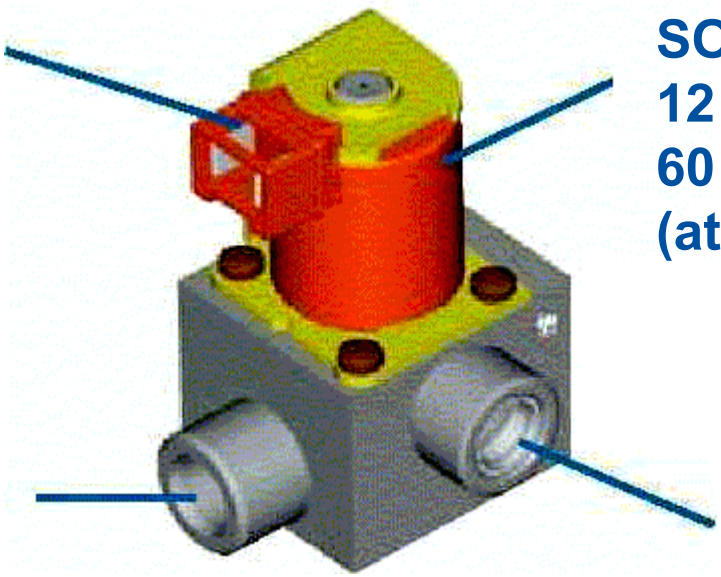
SOLENOID VALVE TERMINALS



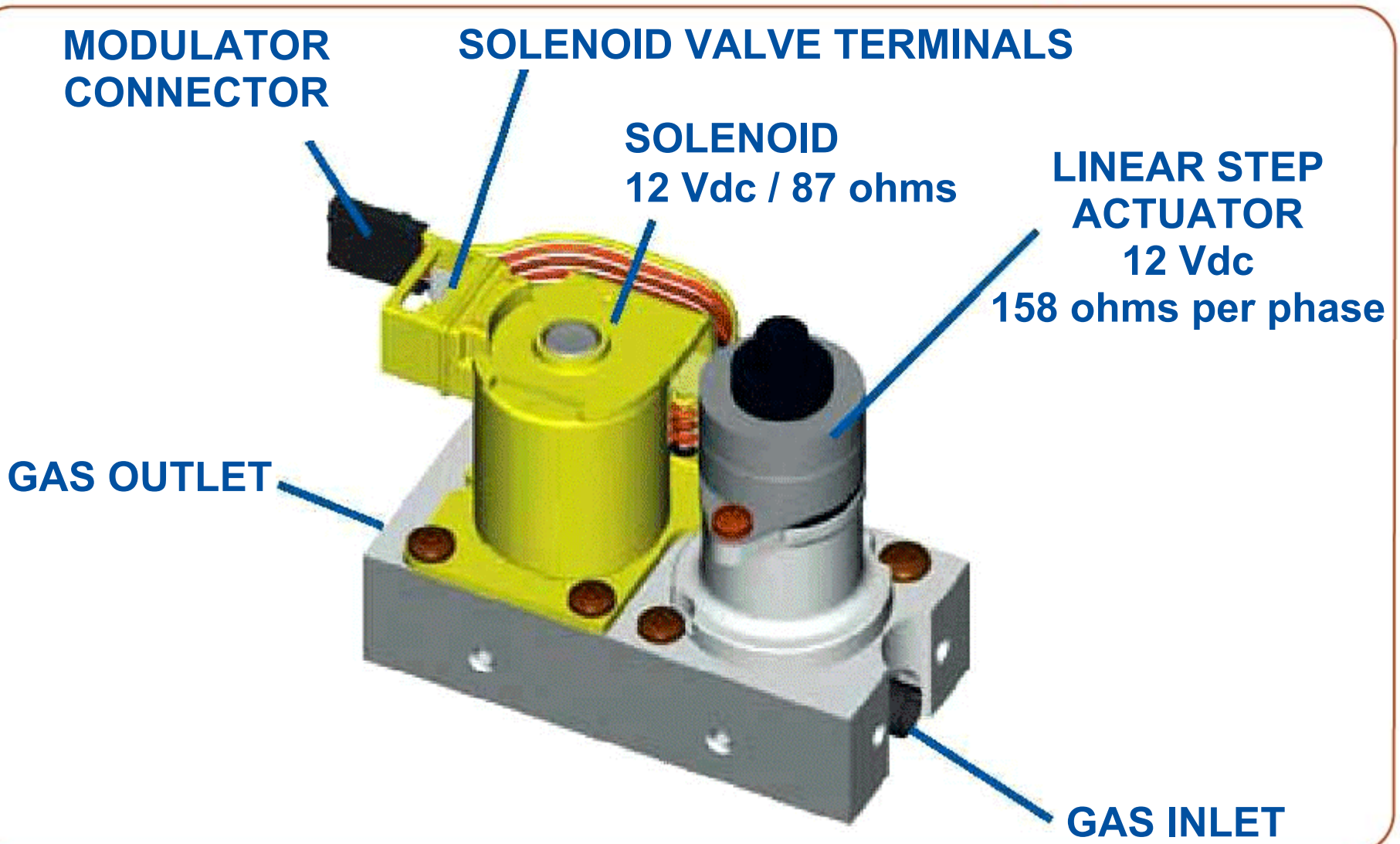
SOLENOID
12 Vdc
60 ohms
(at 20°C)

GAS OUTLET

GAS INLET

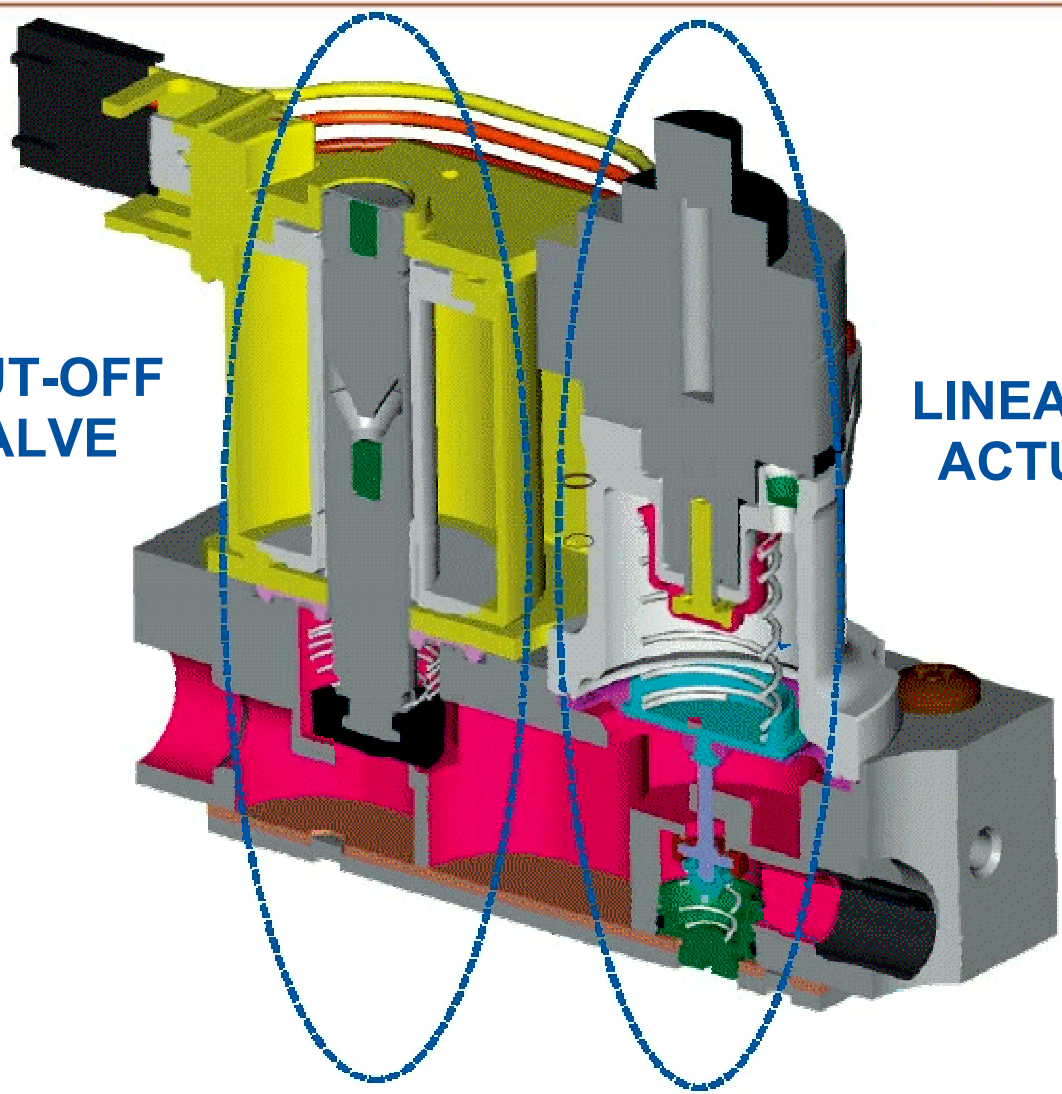
Modulation Valve

Electrolux



Modulation Valve

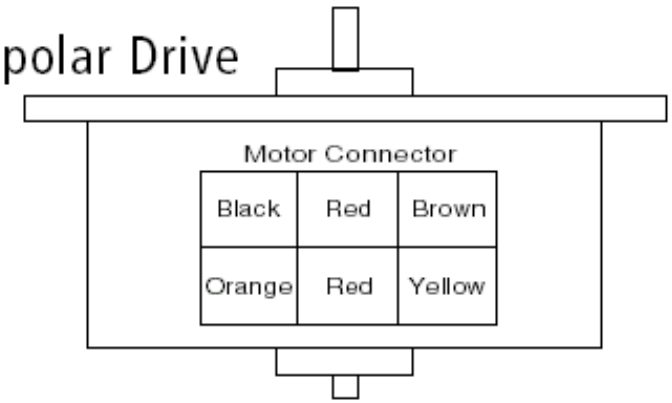
Electrolux



Step Motor

Electrolux

Unipolar Drive



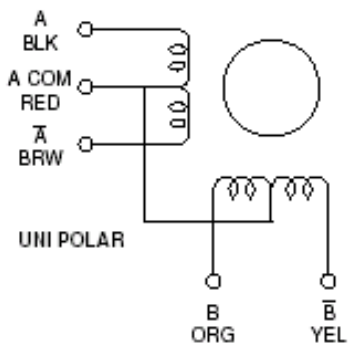
Unipolar Drive

CW Rotation

CCW Rotation

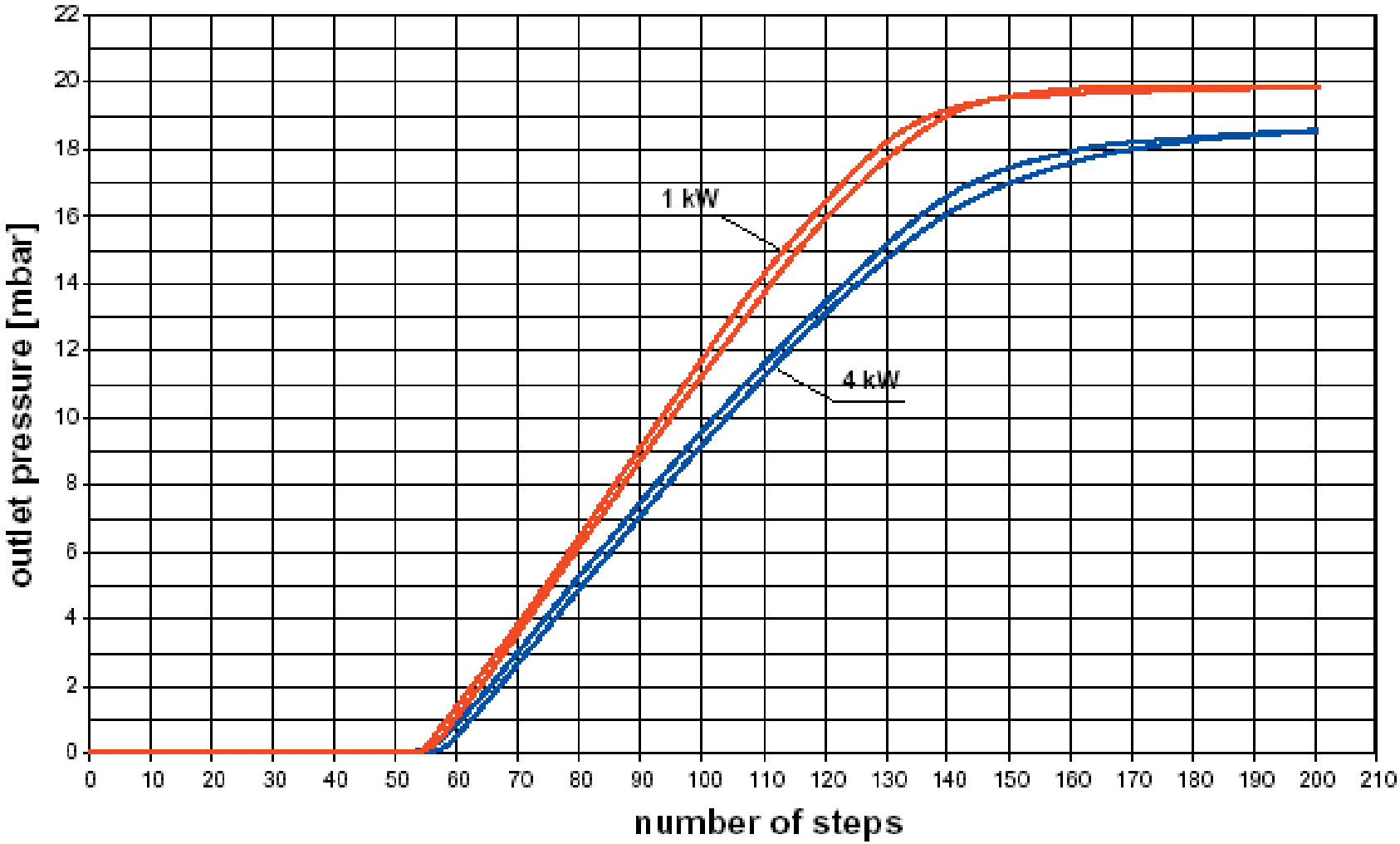
	Black	Brown	Orange	Yellow	Red/Red
1	–			–	+
2	–		–		+
3		–	–		+
4		–		–	+

CW Rotation Facing Mounting End



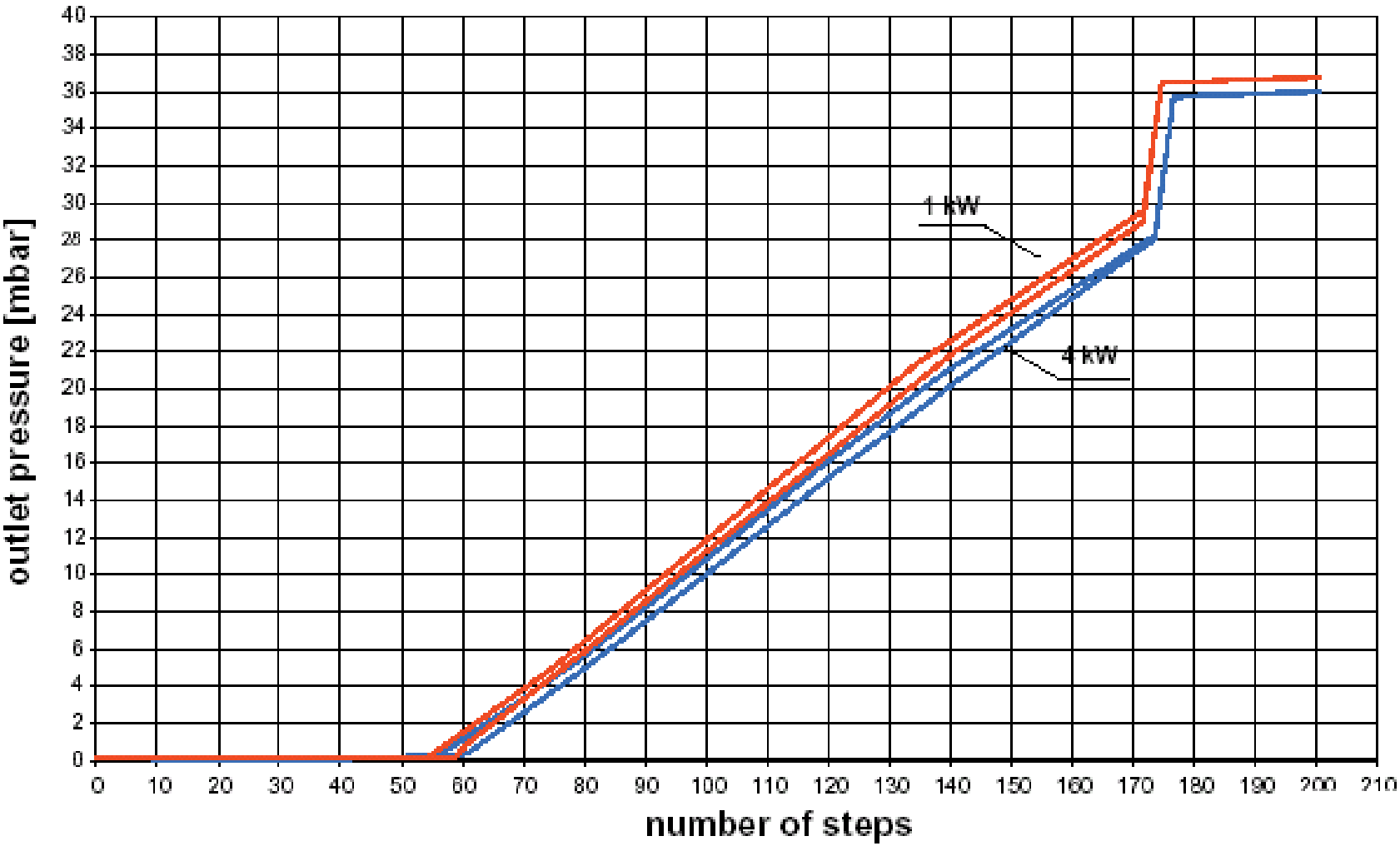
Characteristic of Step Actuator Natural Gas 20 mbar

Electrolux



Characteristic of Step Actuator
LPG 37 mbar

Electrolux

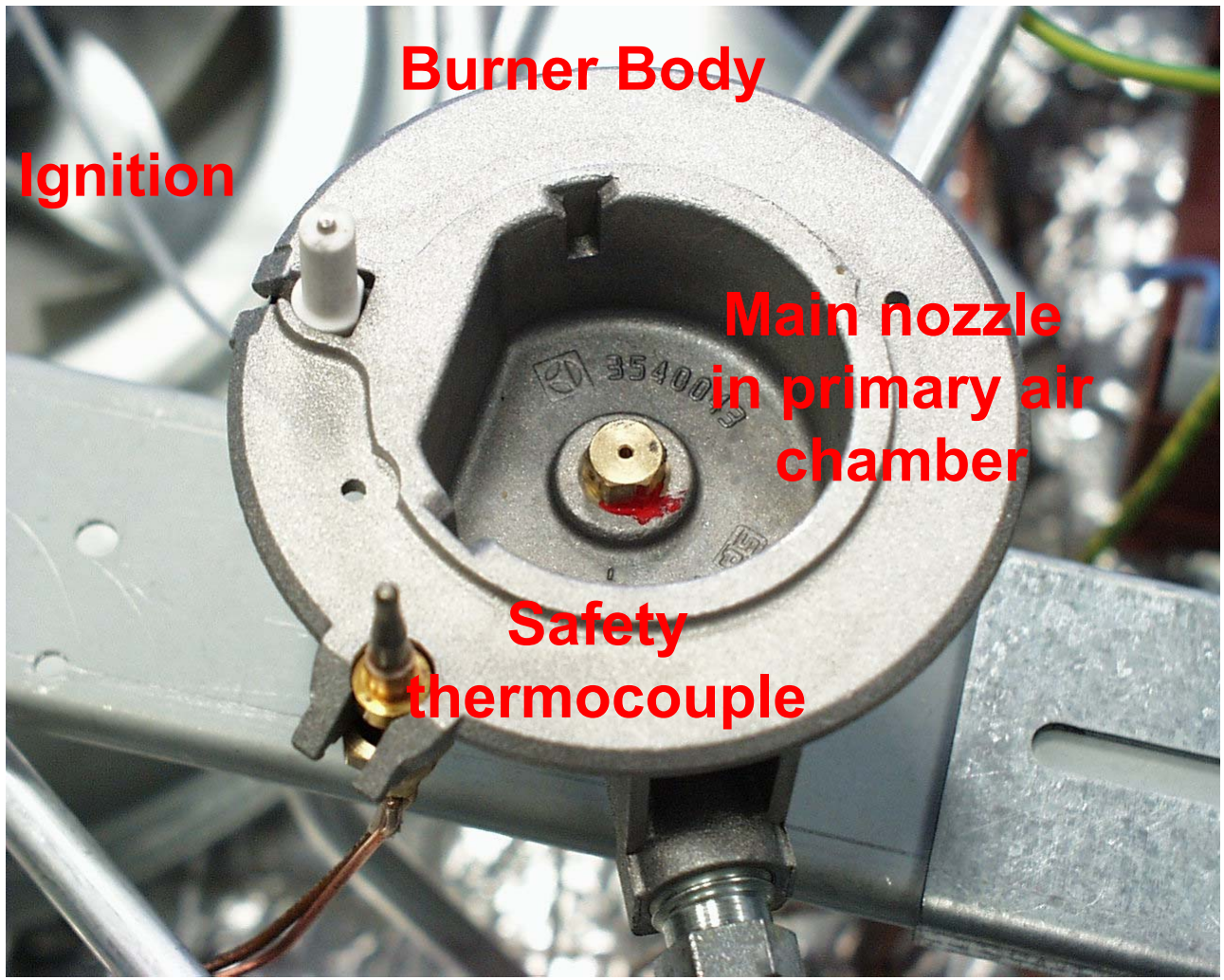


Flame Modulation

Electrolux

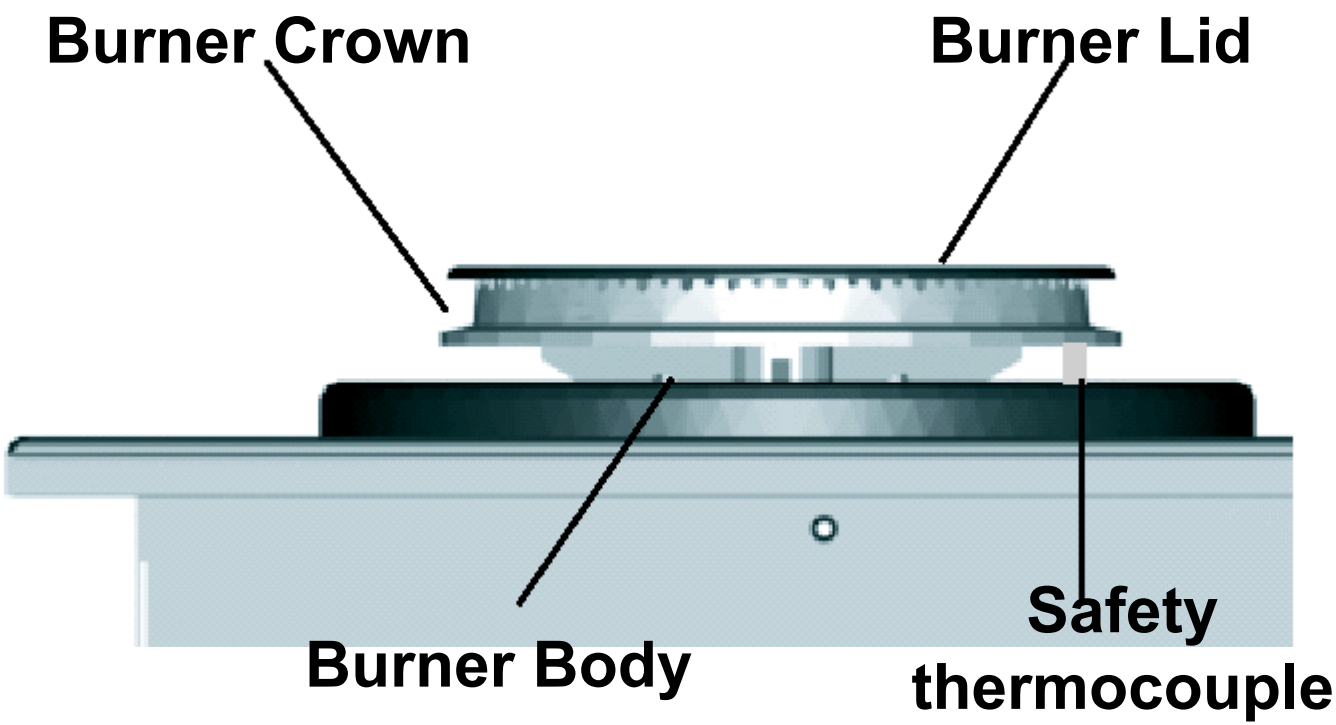
- The flame can be set in 6 levels
- At maximum level, the valve is always fully open
- The other 5 flame levels are defined for each type of gas by a so-called map stored in the EEPROM
- This map is a set of 5 step values for the step motor

Electrolux Burners



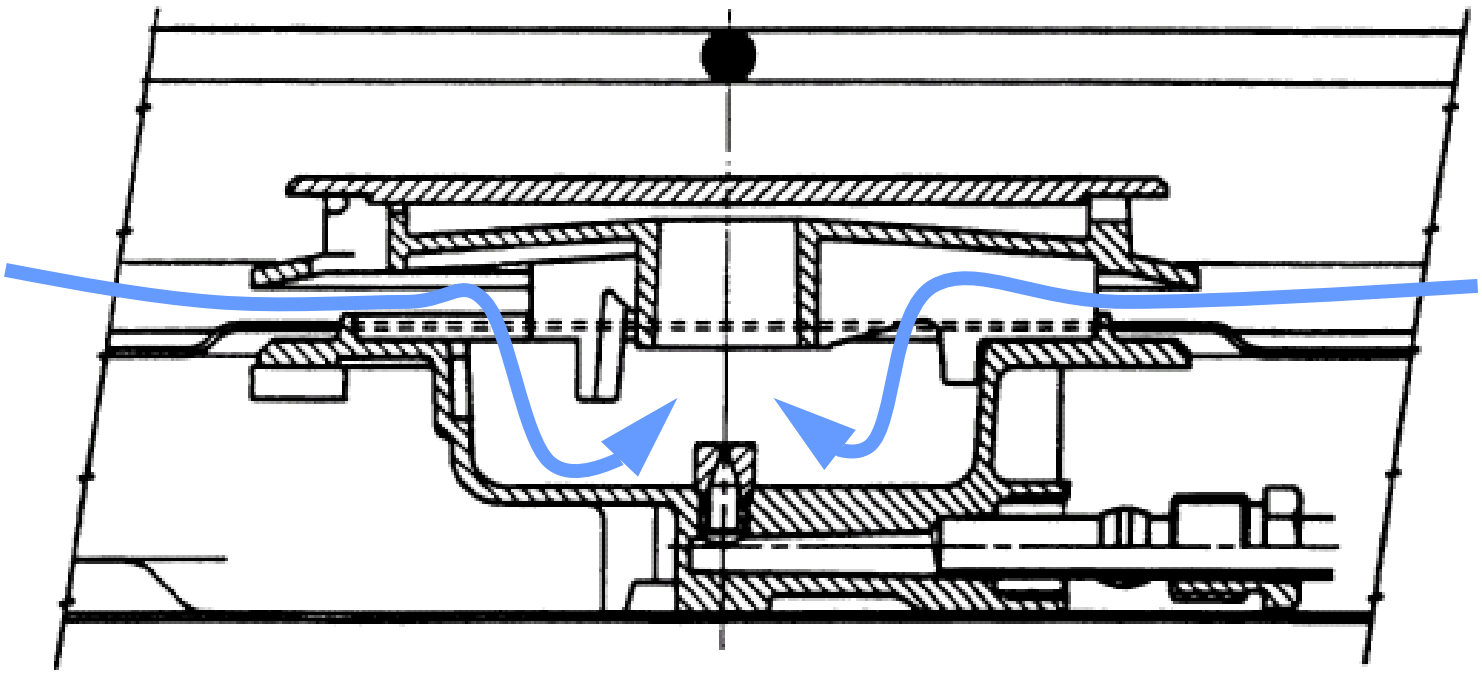
Electrolux Burners

Electrolux



Electrolux Burners

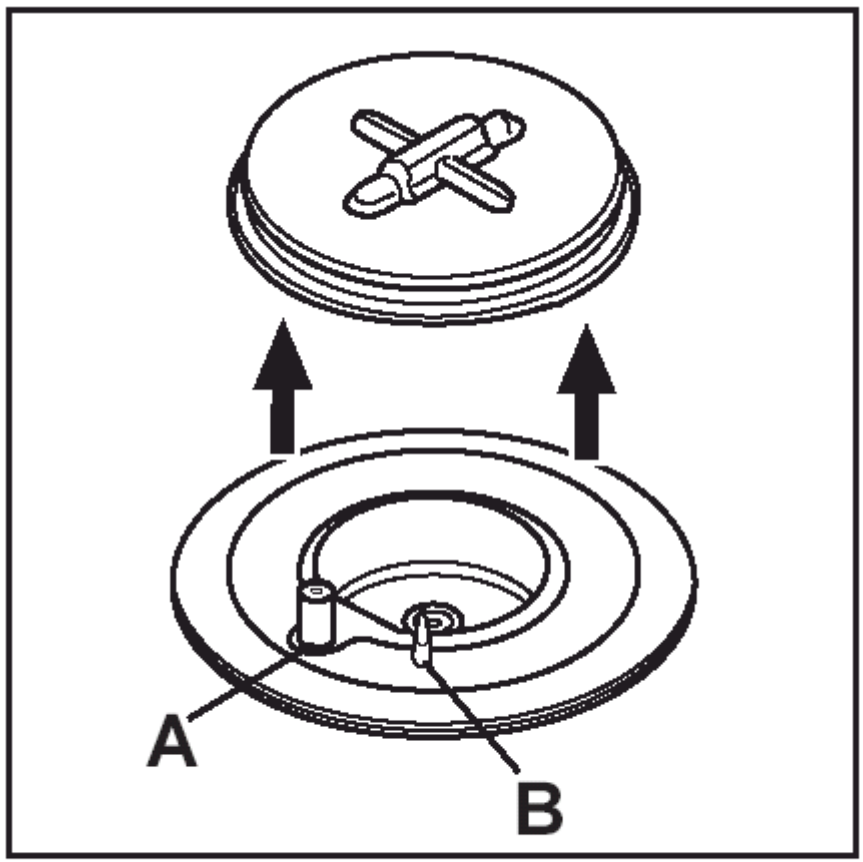
Electrolux

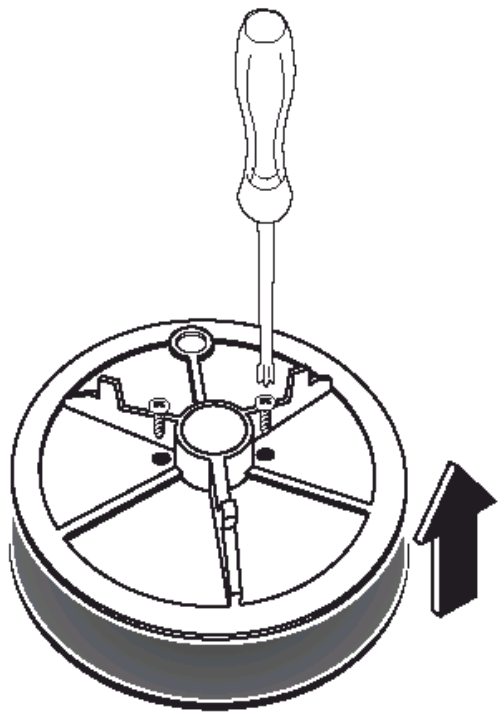


Primary air from above, not adjustable

Burners Variants

Electrolux

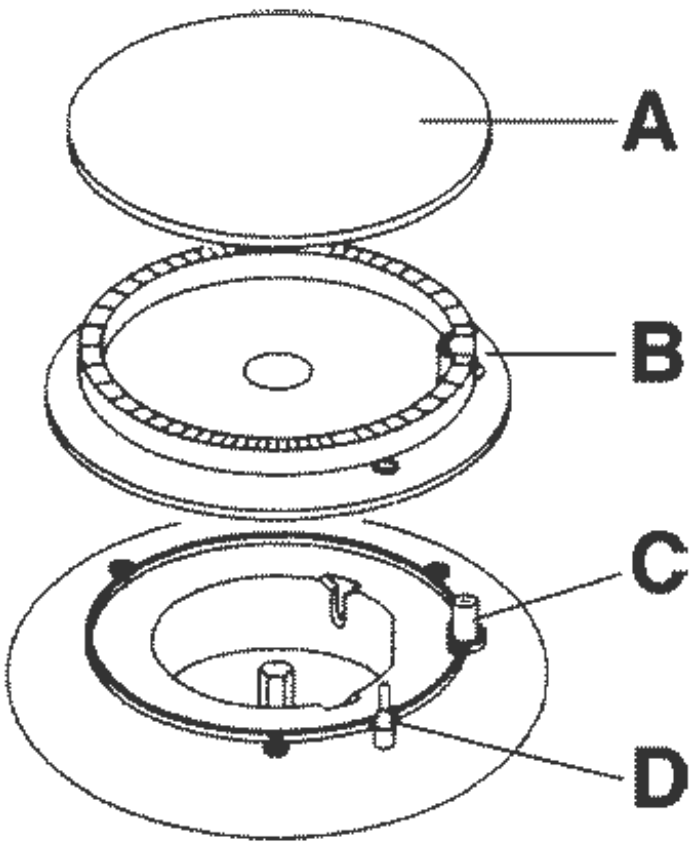




A - Spark plug
B - Thermocouple

Burners Variants

Electrolux



A - Burner Cap
B - Burner crown
C - Spark plug
D - Thermocouple

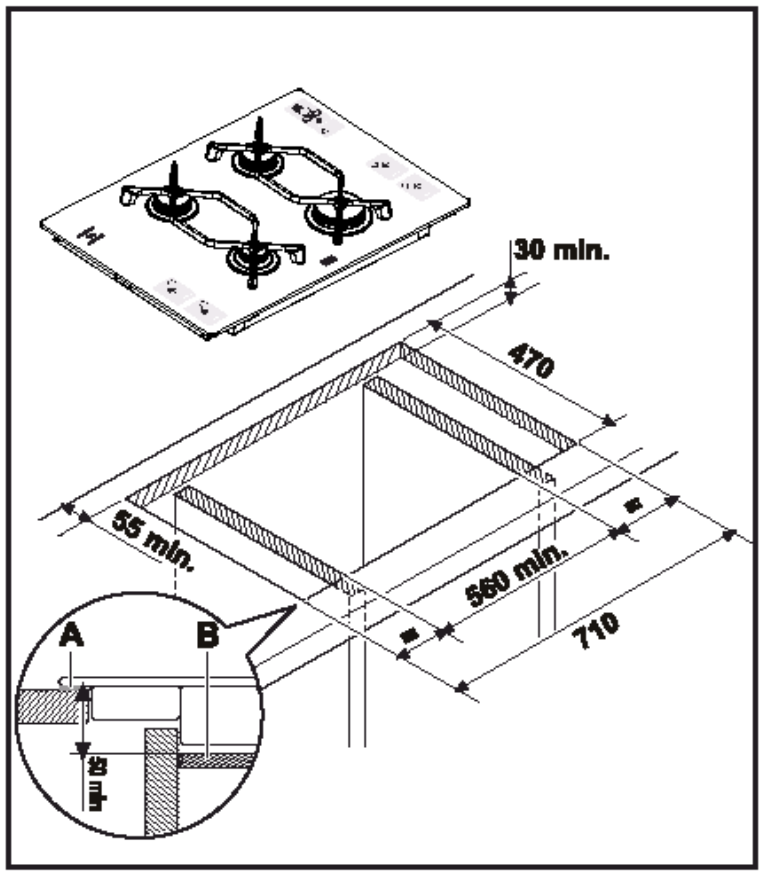
Electrolux Burners

Electrolux

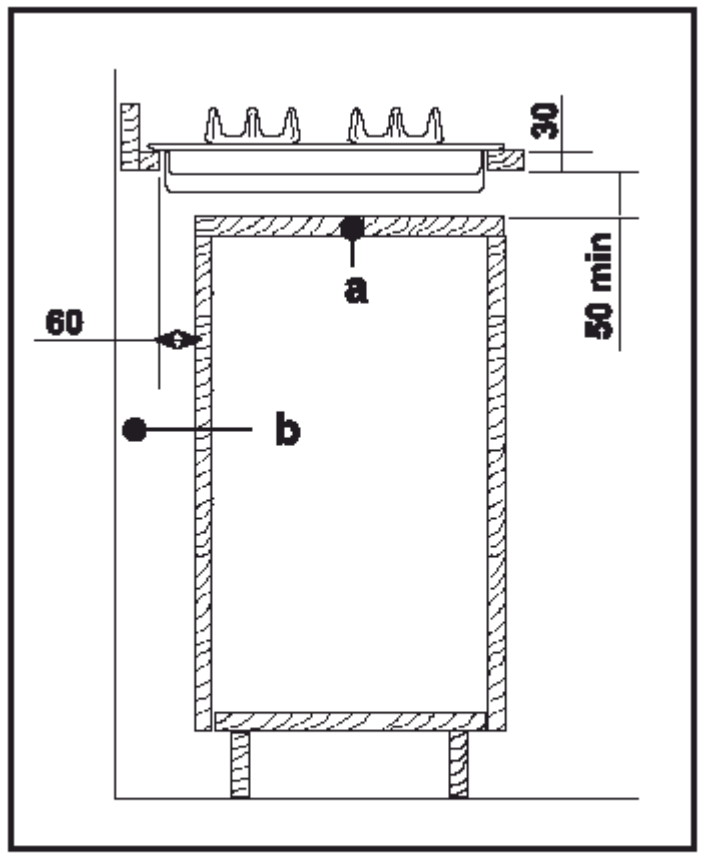
		Burner type				
		Wok	rapid	semirapid	auxiliary	
natural gas (H/L) 20 mbar	main nozzle H [x 0.01 mm]	146	119	96	70	
	DKK: main nozzle L [x 0.01 mm]	*150*	*133*	*106*	*74*	
	ZO: main nozzle LL [x 0.01 mm]	*153*	*133*	*106*	*74*	
	DKK: by-pass nozzle [x 0.01 mm]	44	39	30	25	
	ZO: by-pass nozzle [x 0.01 mm]	56	40	32	28	ON APPLIANCES ADJUSTABLE TO LPG 30mb
	ZO: by-pass nozzle [x 0.01 mm]	45	35	28	23	ON APPLIANCES ADJUSTABLE TO LPG 50mb
	DKK: max. power [kW]	3.8	3	1.9	1	
	ZO: max. power [kW]	4	3	2	1	
	DKK: min. power [kW]	0.9	0.55	0.45	0.35	
	ZO: min. power [kW]	1.2	0.65	0.45	0.33	
LPG 30 mbar	main nozzle [x 0.01 mm]	98	86	71	50	
	DKK: by-pass nozzle [x 0.01 mm]	44	39	30	25	
	ZO: by-pass nozzle [x 0.01 mm]	56	40	32	28	
	power [kW]	4	2.8	2	1	
LPG 50 mbar	DKK main nozzle [x 0.01 mm]	88	75	60	43	
	ZO main nozzle [x 0.01 mm]	92	75	60	43	
	DKK: by-pass nozzle [x 0.01 mm]	39	31	27	23	
	ZO: by-pass nozzle [x 0.01 mm]	45	35	28	23	
	DKK: power [kW]	4	2.8	2	1	
	ZO: power [kW]	4	3	2	1	
burner diameter [mm]		130	104	74	58	
lid diameter [mm]		126 / 46	102	72	55	
gasket diameter [mm]		171	134	126 / 95	126 / 95	

Installation : Dimensions

Electrolux



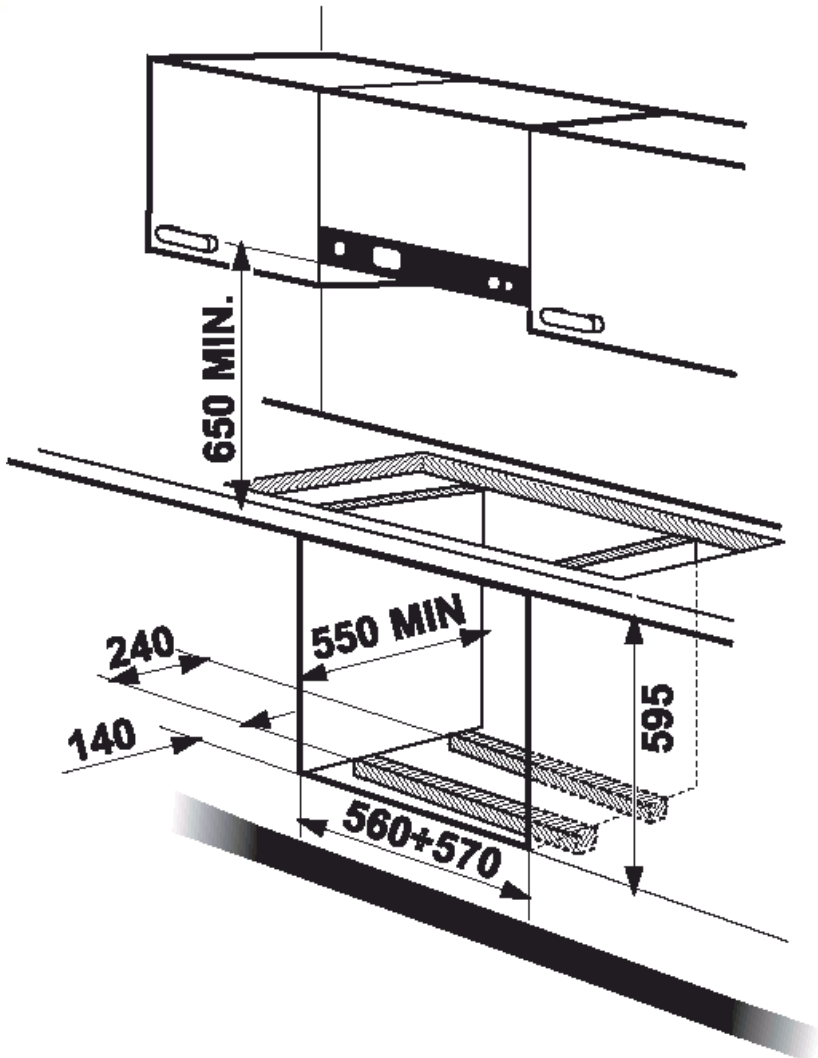
A) Worktop
B) Removable Panel



a) removable panel
b) space for connections

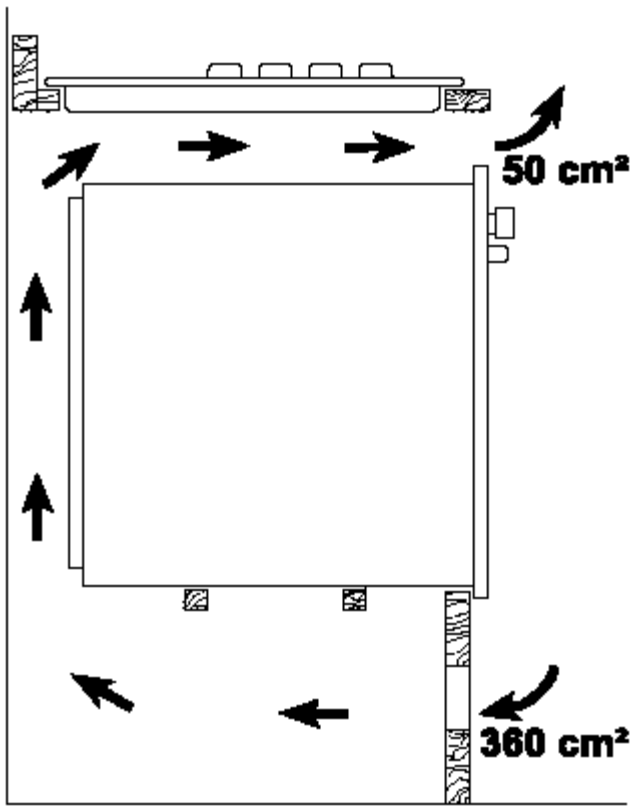
Installation : Dimensions

Electrolux

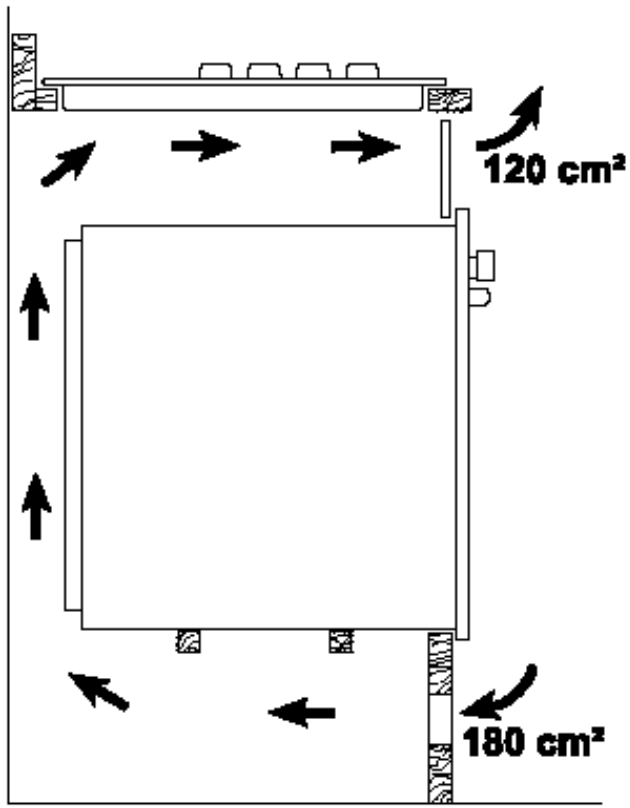


Installation : Ventilation

Electrolux



or



Installation :
Electrical Connection

Electrolux

- **Cable fitted to appliance :**
  H05 V2V2-F (T90) 3x0.75 mm², without plug
- **Connect appliance to mains supply**
  - **either with a suitable plug-and-socket connection (UK: 3 Amp fuse)**
  - **or with a fixed connection; in this case a double pole switch with a minimum gap of 3 mm must be installed between the appliance and the mains supply**

Installation :
Connect to Power Supply

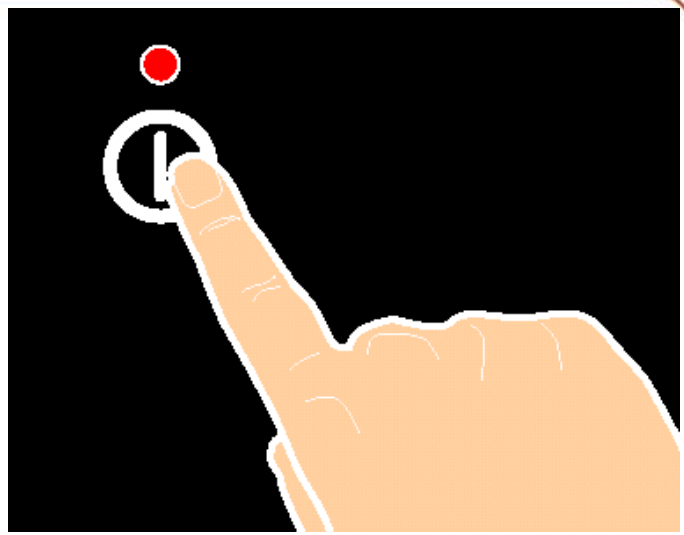
Electrolux

- **An initialization procedure is started after connecting the appliance to the power supply *(or after a power reset)***
- **All LEDs will illuminate for some seconds, then extinguish again**
- **The hob can be switched on now**

Operation : Switch On Hob

Electrolux

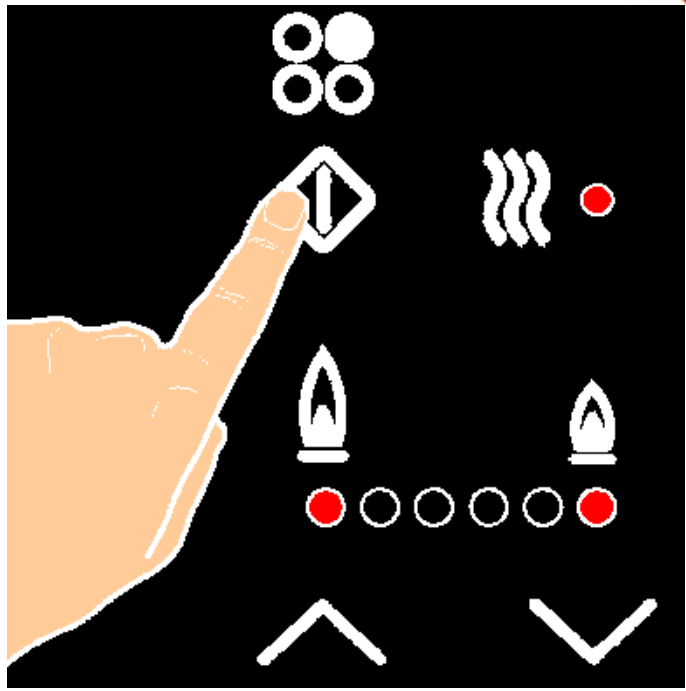
- Touch the main ON/OFF control for about 3 seconds
- The power control LED will illuminate, a long beep will sound
- The hob is ready for use now
- If no other control is activated within 30 seconds, the hob will be switched off automatically



Operation :
Switch On Burner

Electrolux

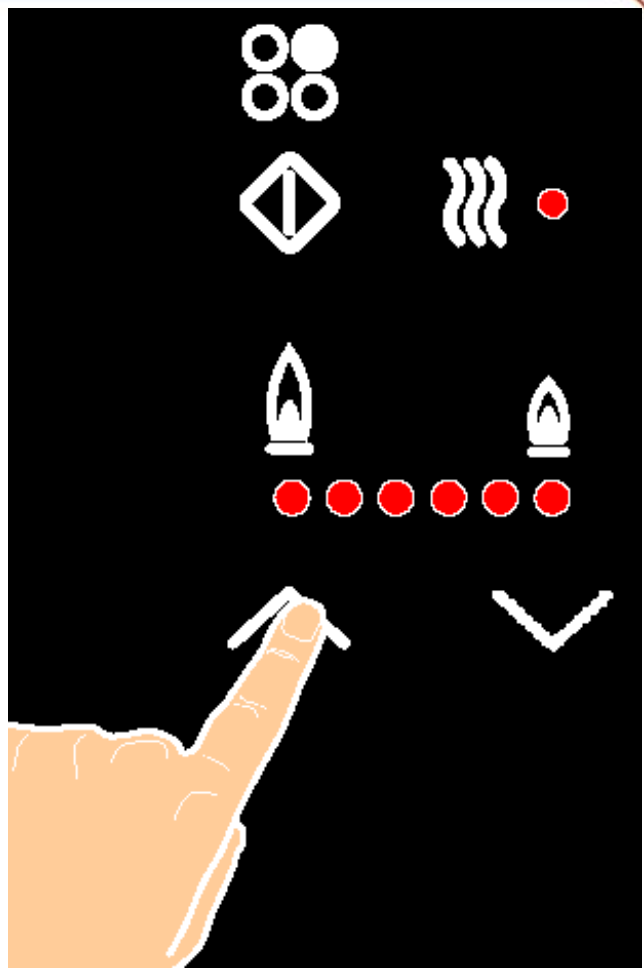
- Touch the Ignition control of the required burner
- The 2 outer LEDs of the flame level indicator, and the residual heat LED, will illuminate
- Within 3 seconds, touch either the Flame Increase or the Flame Decrease Control of that burner



Operation :
Ignite Burner - High Flame Level

Electrolux

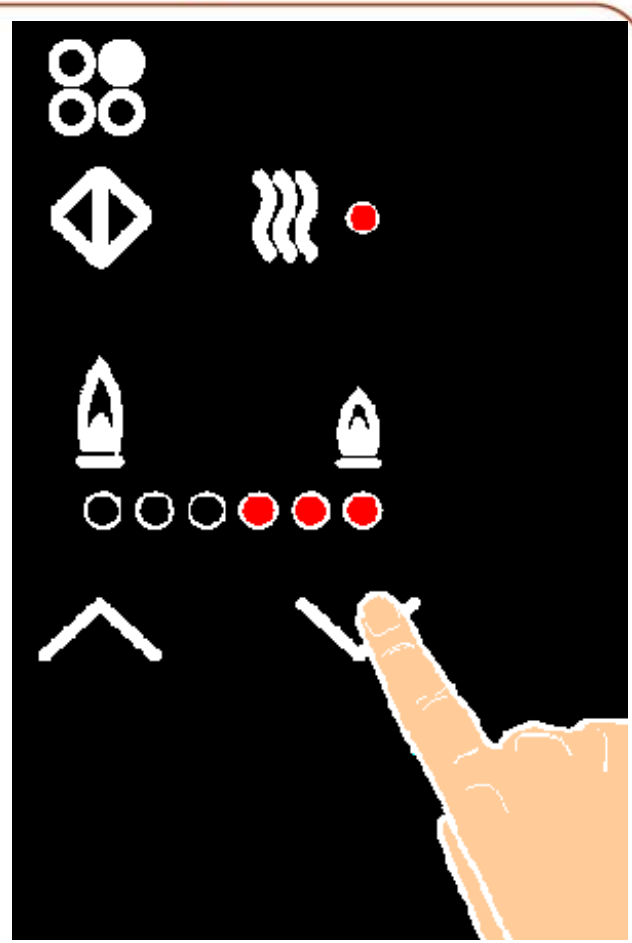
- If the Flame Increase control is used, the burner will ignite at maximum flame level
- All 6 flame level LEDs illuminate
- The power board controls the respective modulation valve, fully opening the gas supply to the burner
- The ignition device is activated for about 6 seconds



Operation :
Ignite Burner - Low Flame Level

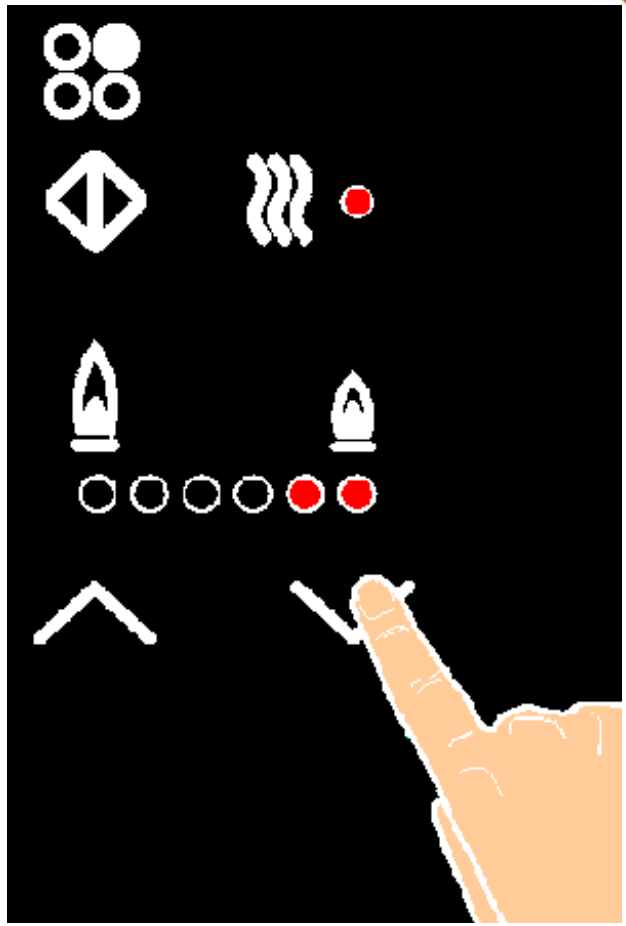
Electrolux

- If the Flame Decrease control is used, the burner will ignite at medium flame level
- 3 flame level LEDs illuminate
- The power board controls the respective modulation valve, opening the gas supply to the burner
- The ignition device is activated for about 6 seconds



Operation :
Select Flame Level

- By further touching either the Flame Increase or the Flame Decrease control, the flame level can be adjusted as required
- The flame level LEDs will show the setting



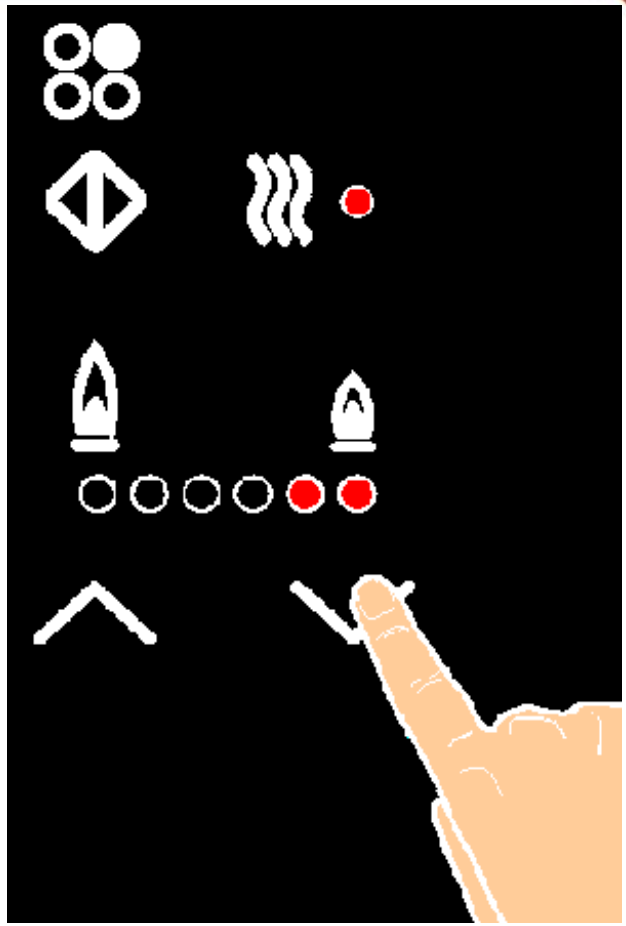
Operation :
Select Flame Level

Electrolux

N.B:

Whichever the selected flame level, the modulation valve will be fully open during ignition, and the flame will start burning at maximum level

The flame will be reduced to the selected level only after the thermocouple safety device delivers a stable signal



Operation :
Ignition of Several Burners

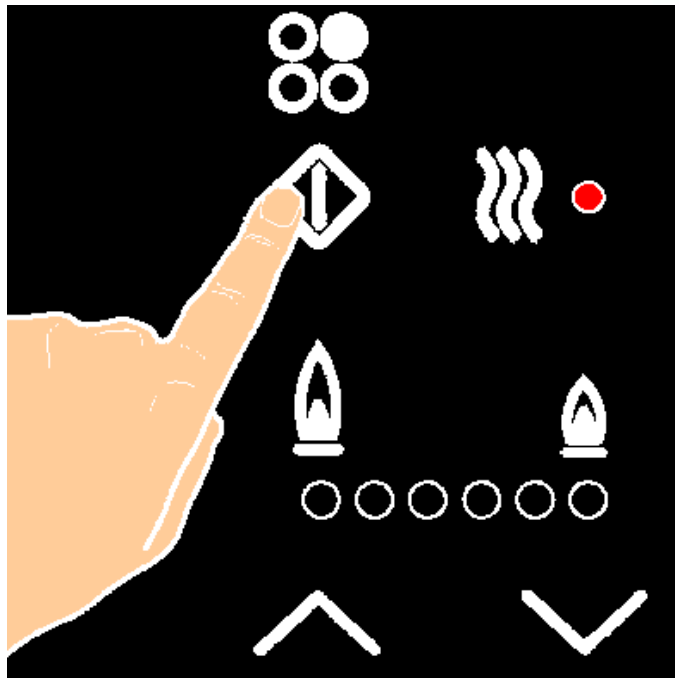
Electrolux

- **If ignition is selected for more than 1 burner, these will be ignited sequentially, i.e. the ignition procedure must be finished for one burner before it is started for the next one**

Operation :
Switch Off Burner

Electrolux

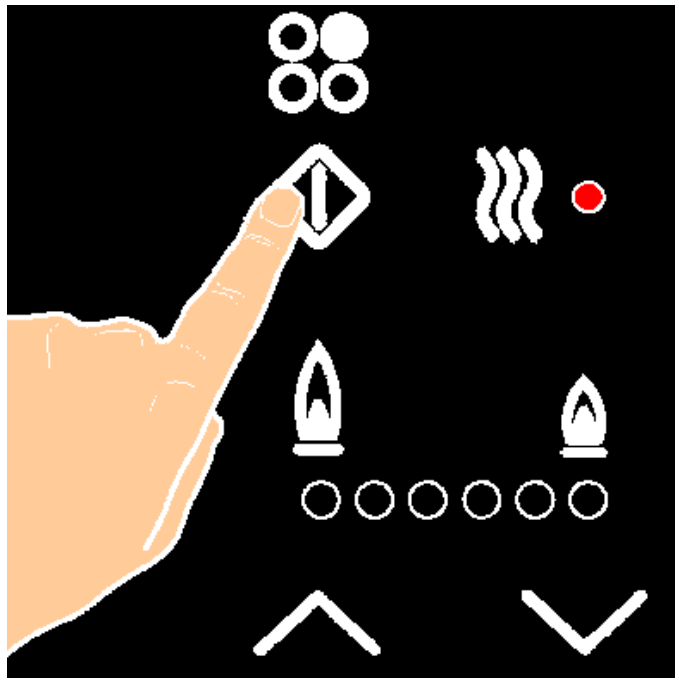
- **To switch of one burner, touch the repective Ignition Control**



Operation :
Residual Heat Indicator

Electrolux

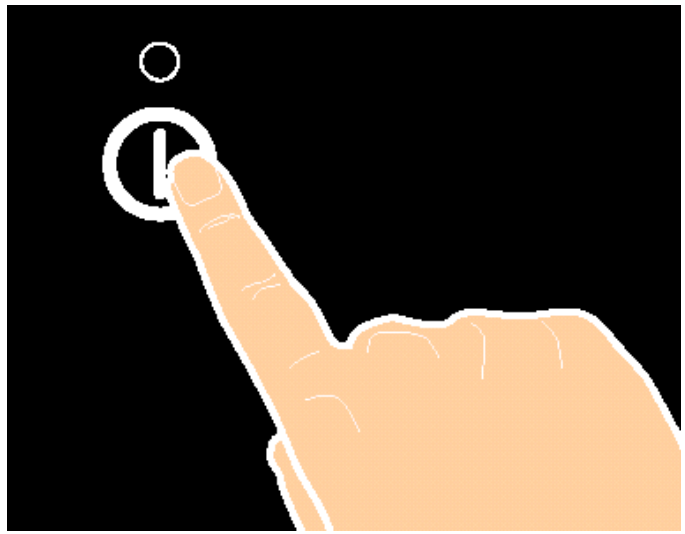
- After switching off the burner, the respective residual heat indicator LED will stay on for about 40 minutes (only time-controlled)
- The LED will not light up again after a power reset, even if the burner is still hot



Operation :
Switch Off Hob

Electrolux

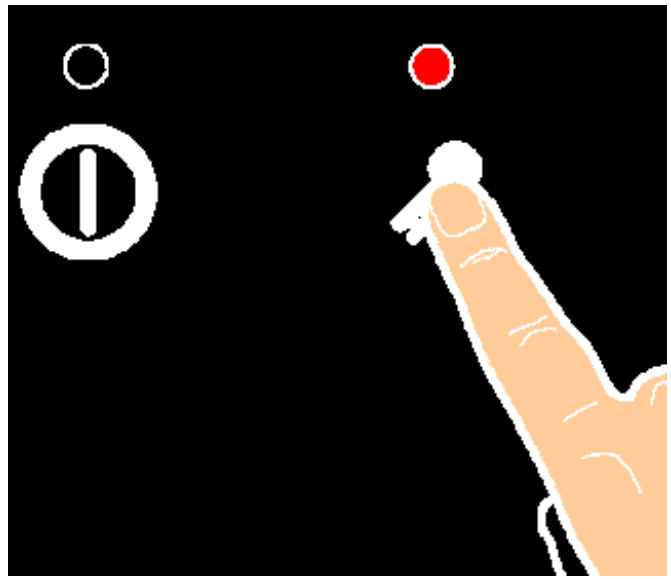
- **To switch off the hob, i.e. all burners and the timer, touch the main ON/OFF control**



Operation :
Lock (Child Lock)

Electrolux

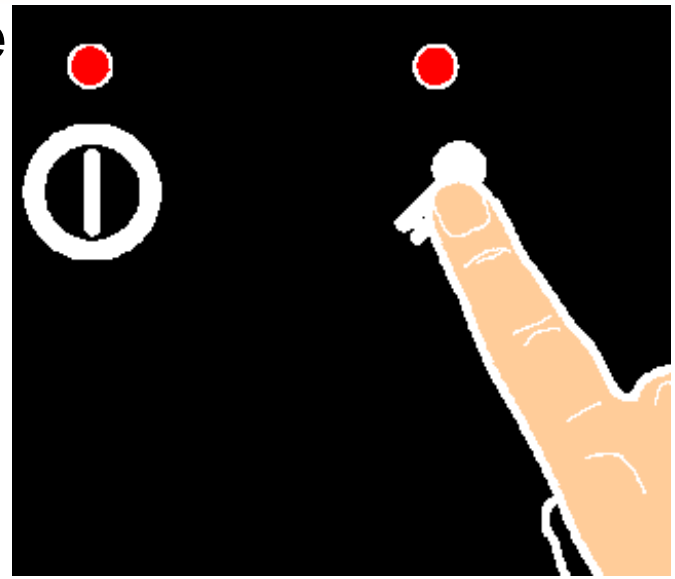
- Hob is switched OFF
- Touch Lock control for about 3 seconds, until the associated LED illuminates, and a long beep is heard
- To switch on the hob, the child lock must be de-activated first, by touching the Lock control again, until LED extinguishes, and long a long beep is heard



Operation :
Lock (Function Lock)

Electrolux

- Hob is switched ON, at least one burner functioning
- Touch Lock control for about 3 seconds, until the associated LED illuminates, and a long beep is heard
- Flame setting can‘t be changed, only the OFF control is active
- To de-activate the lock, touch the Lock control again until LED extinguishes and a long beep is heard, or switch off the hob



Ignition Failure

Electrolux

- Spark generator will attempt ignition for about 6 seconds
- If ignition is not successful, the gas supply to this burner is interrupted for 3 seconds, after which sparks are again generated for 6 seconds
- If ignition fails after 3 attempts, the burner will go into safety mode
- The selected segments of the flame level indicator will flash
- Fault “01” is shown flashing in timer display for the respective burner (if timer is switched on)

Automatic Reignition

Electrolux

- If the flame is accidentally extinguished, this is detected by the thermocouple, and the main board will close the respective shut-off valve to interrupt the gas flow
- After 20 seconds, the gas flow is opened again, and the ignition procedure is restarted
- After 3 unsuccessful attempts, the burner will go into safety mode
- The selected segments of the flame level indicator and the residual heat indicator will flash
- Fault “01” is shown flashing in timer display for the respective burner (if timer is switched on)

Overheating

Electrolux

- If the NTC sensor on the main board detects a temperature of 95°C, all functioning burners are switched to minimum flame level
- If temperature continues to increase, reaching 105°C, the hob is switched off completely, and goes into safety mode
- Fault “09” is shown flashing in the timer display for all burners (if timer is switched on)

Burner Safety Switch Off

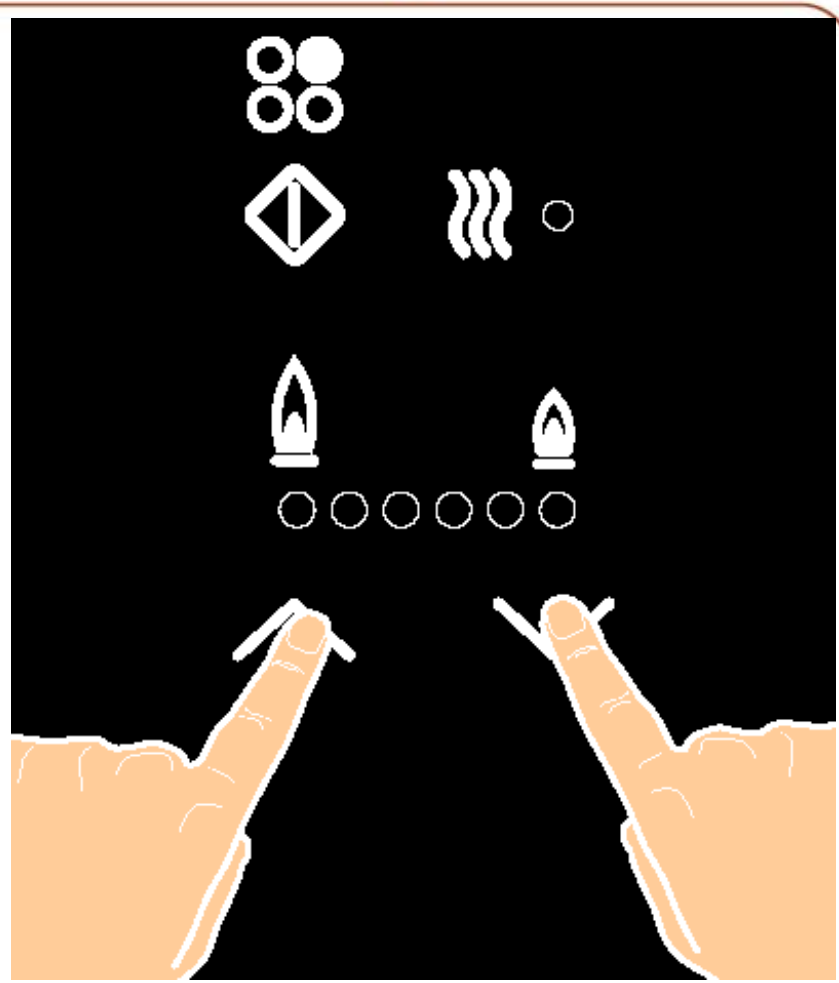
Electrolux

- Any burner will be automatically switched off after 4 hours from the last user intervention (e.g. flame level adjustment)
- The burner goes into safety mode
- Fault “10” is shown flashing in timer display for the respective burner (if timer is switched on)

Operation :
Safety Mode Reset

Electrolux

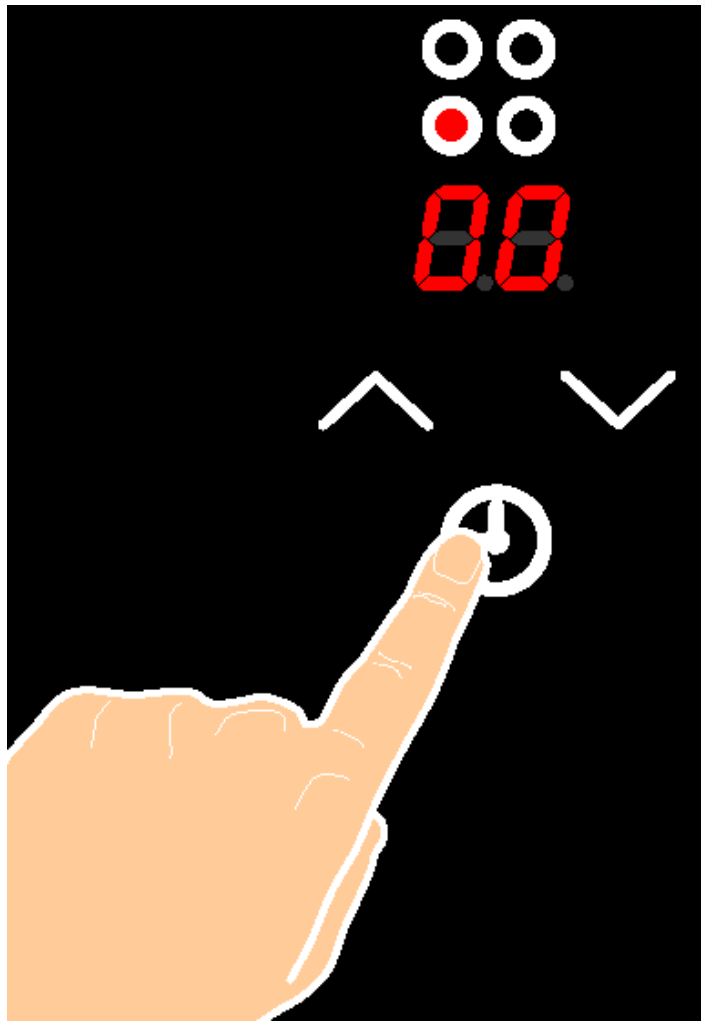
- When a safety mode is set on one or more burners, the respective controls cannot be operated for about 60 seconds
- After this, the burner (or the hob), can be re-activated by simultaneously touching the Flame Increase and the Flame Decrease controls



Operation : Switch-off Timer

Electrolux

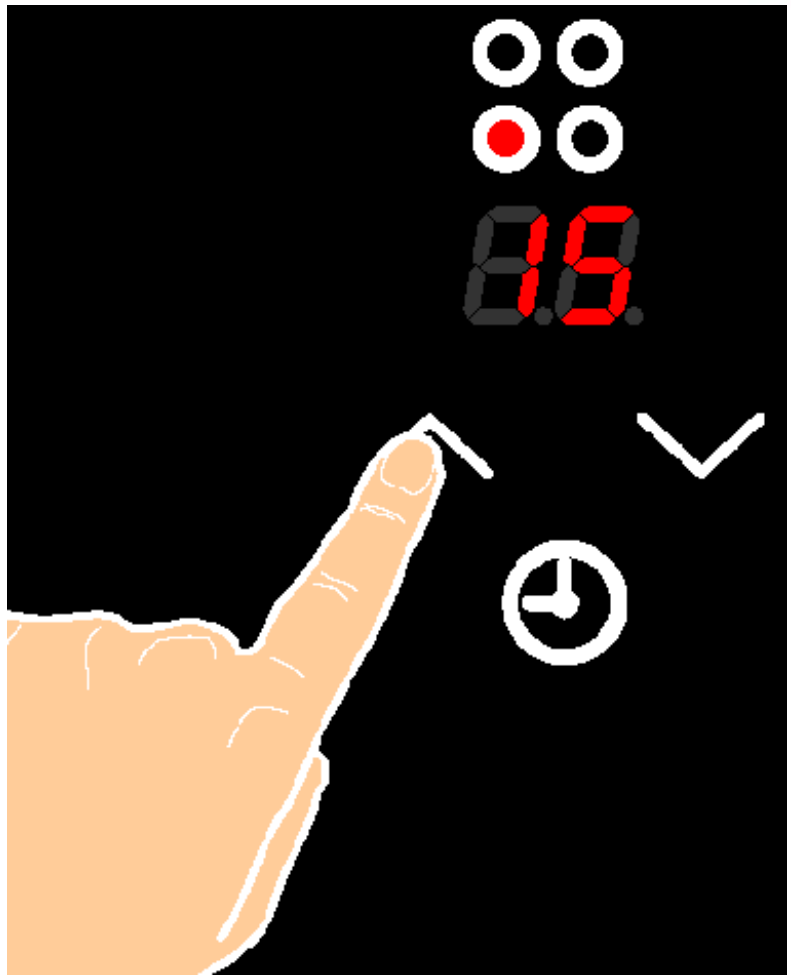
- Ignite the required burners
- If more burners are operating, the switch-off timer can be set for one of them only
- Repeatedly touch the Timer control, until the LED corresponding to the desired burners illuminates



Operation : Switch-off Timer

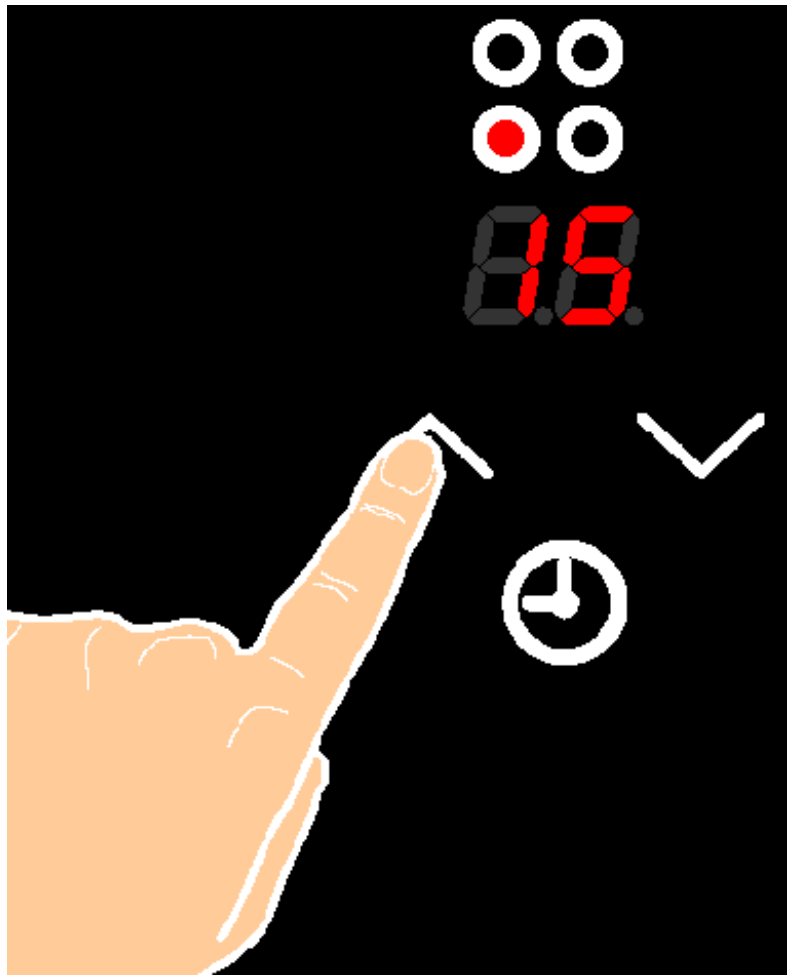
Electrolux

- Set the time (up to 99 minutes) by using the Time Increase or Time Decrease controls
- Countdown will start immediately
- Countdown of the last minute is in seconds, last 10 secs accompanied by beeps
- Repeated beeps after switch off - touch Timer control to cancel



Operation :
Minute Minder

- **If the timer is set when none of the burners are operating, it will act as a minute minder**



Conversion to Another Gas

Electrolux

Change the main nozzle using a 7 mm socket spanner

Single Nozzles
Marking / Spare Part Numbers

Electrolux

	auxiliary burner	semirapid burner	rapid burner
natural gas H 20 mbar	70 354 400 413 / 2	96 354 400 412 / 4	119 354 400 404 / 1
natural gas L 25 mbar (NL)	71 354 400 436 / 3	100 354 400 435 / 5	124 354 400 434 / 8
LPG 28-30/37 mbar	50 354 400 071 / 8	71 354 400 036 / 1	86 354 400 432 / 2

Kits

Electrolux

The following kits can be used for conversion or retrofit:

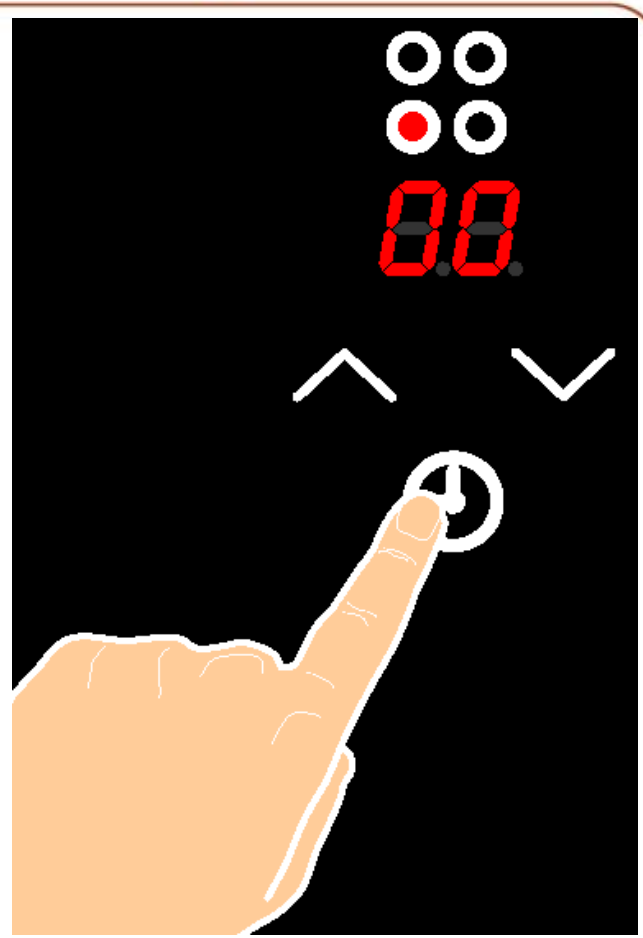
- **for natural gas H, 20 mbar:**
  - **5026 73 42-00 / 9: 1 x 0.70; 2 x 0.96; 2 x 1.19**
  - **5027 36 08-00 / 5: 1 x 0.70; 3 x 0.96; 1 x 1.19; 1 x 1.46*; 1 x 1.13****
- **for natural gas L, 25 mbar (NL):**
  - **5026 45 43-00 / 5: 1 x 0.71; 3 x 1.00; 1 x 1.24; 1 x 1.33***
- **for LPG, 28-30 / 37 mbar:**
  - **5027 36 09-00 / 3: 1 x 0.50; 3 x 0.71; 1 x 0.86; 1 x 0.98***
  - **5026 94 49-00 / 0: 1 x 0.50; 2 x 0.71; 1 x 0.86; 1 x 0.83***

***nozzle for 3-crown burner*

** nozzle for oven burner*

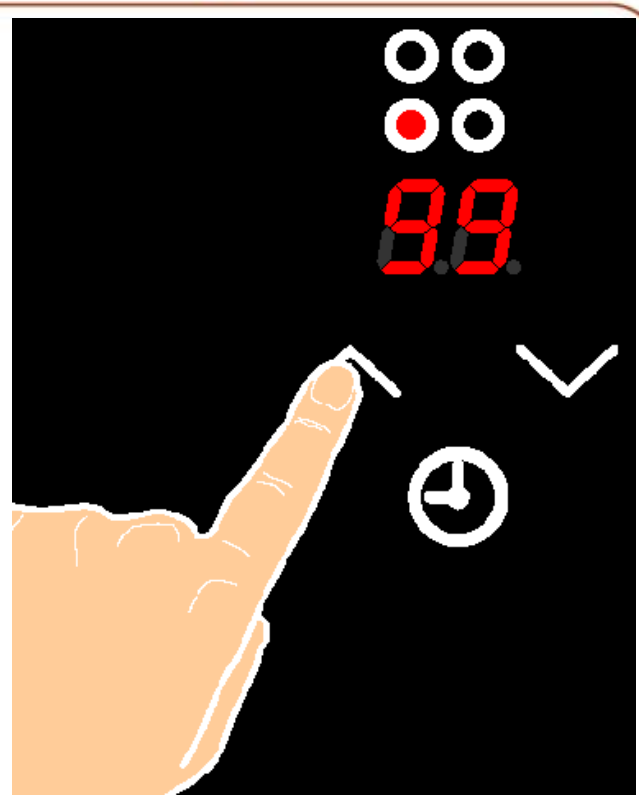
Setting the Gas Type

- After changing the nozzles, the gas type must be set in the main board
- To do this, switch on the hob
- Switch on the timer and set it to the auxiliary burner (front left)



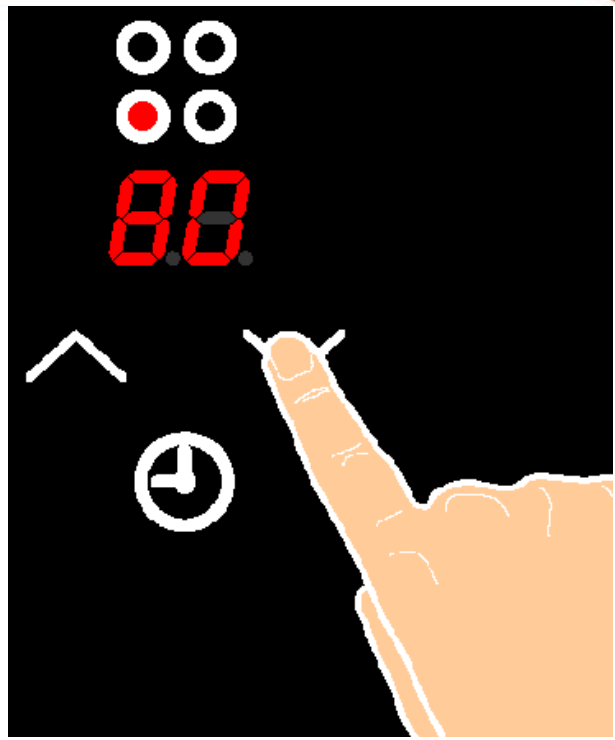
Setting the Gas Type

- **Using the Time Increase control, set timer to 99**



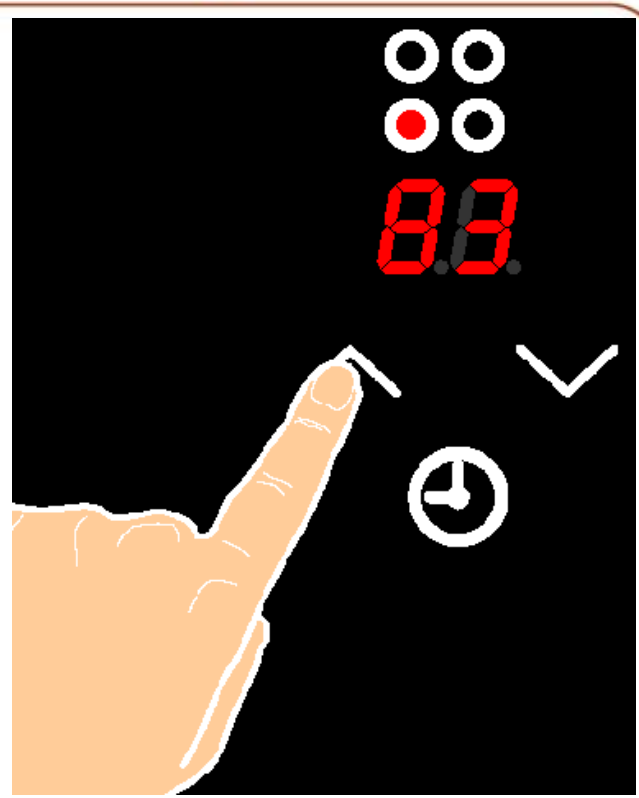
Setting the Gas Type

- **Using the Time Decrease control, set timer to 80 (or below)**



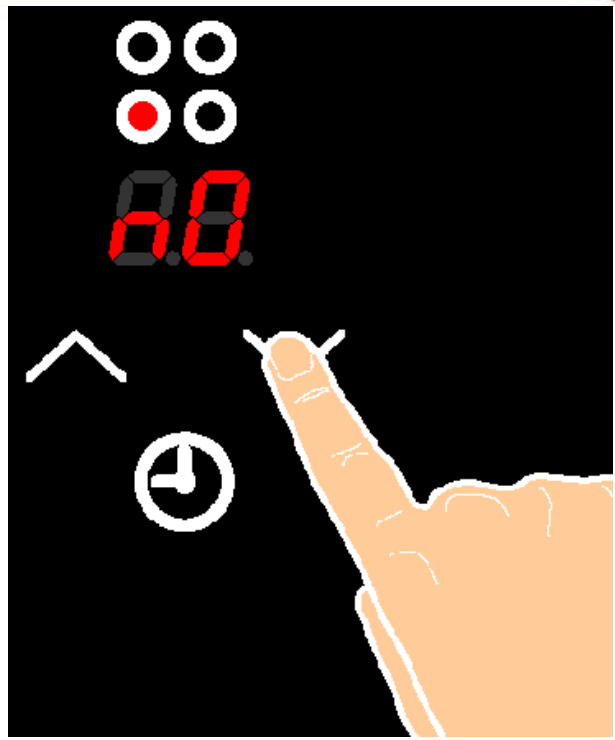
Setting the Gas Type

- **Using the Time Increase control, set timer to 83**



Setting the Gas Type

- The timer display will now show the current setting, usually „n0“ (factory setting)
- If required, change the setting in accordance with instructions
- If „n2“ is not defined for the respective model, the hob will not work with this setting (eventually showing fault „01“)



Minimum Flame Adjustment

Electrolux

- If the flame aspect and the flame stability are not satisfactory, carry out the procedure of „Setting the Gas Type“, until the setting is shown
- Ignite the burner to be adjusted - an automatic adjustment will be carried out, in the course of which the burner may repeatedly extinguish an re-ignite
- During this sequence, a manual adjustment can be done by using the Flame Increase or Flame Decrease controls

Flame Adjustment

Electrolux

- If the minimum flame level (step 1) is manually adjusted, this means that the step value for level 1 is changed
- The step values for levels 2 to 5 will be shifted accordingly
- Level 6 remains unchanged (fully open), the flame level being determined only by the inlet pressure and by the size of the nozzle

Fault Codes

Electrolux

- **If a fault condition occurs on one burner, this will be shown by flashing flame level LEDs and residual heat LED *(N.B.: not always all 7 LEDs will flash, but only those which were illuminated when the fault condition occured)***
- **To read the fault code, switch on the timer, and set it to the respective burner: a flashing 2-digit decimal fault code is shown**

Fault Codes

Electrolux

- Faults are marked B or S on the following slides
- B faults affect only individual burners:
  - the affected burner goes into safety mode
  - the fault code is shown in the timer display only when the timer is set to the respective burner
  - the system, and the other burners, remain operative
- S faults affect the whole system
  - the system, and all burners, are locked
  - the fault code is shown in the timer display for all burners

Fault Codes
Possible Causes

Electrolux

00 - No error

01 B No flame after retry

- Absence of spark
- Absence of gas supply
- Incorrect spark
- Wrong position of burner cap
- Wrong position of thermocouple
- Wrong connection of thermocouple
- Main shut-off valve faulty
- Burner shut-off valve faulty
- Wrong gas setting
- Main board faulty

Fault Codes
Possible Causes

Electrolux

02 B Solenoid valve feedback fault

- Wiring to burner shut-off valve faulty
- Burner shut-off valve faulty
- Main board faulty

Fault Codes
Possible Causes

Electrolux

03	B	Step motor phase 1 fault
04	B	Step motor phase 2 fault
05	B	Step motor phase 3 fault
06	B	Step motor phase 4 fault
07	B	Step motor enable fault

For all above:

- Wiring to step motor faulty
- Step motor faulty
- Main board faulty

Fault Codes
Possible Causes

Electrolux

08 **B** **Generic fault**

- Main board faulty

09 **S** **Temperature out of range**

NTC on main board detects temperature > 105°C

- Overheating - wait for cool down
  (if frequent, check for causes, e.g. excessive use , unfavourable build-in situation)
- Main board faulty

Fault Codes
Possible Causes

Electrolux

10 B Continuous run timeout

Timeout exceeded (burner on for more than 4 hours without any user intervention)
No fault (normal safety function)

11 S Power supply Vpp fault

Fault in 12.8 V supply on main board

12 S Power supply Vdd fault

Fault in 3.3 V supply on main board

Fault Codes
Possible Causes

Electrolux

13 - **Power supply battery**

Battery discharged or missing
(Only when battery backup kit is installed !)

14 B **Abnormal thermocouple condition**

Parasite flame detected by thermocouple

- Thermocouple faulty
- Thermocouple wiring faulty
- Main board faulty

Fault Codes
Possible Causes

Electrolux

15	S	System locked, fatal fault
16	S	NTC sensor fault NTC value out of working range (broken / short circuit)
17	S	Time base ratio fault (time slot monitoring)
18	S	AD converter fault
19	S	Data memory fault
20	S	Program memory fault / configuration bit fault

Fault Codes
Possible Causes

Electrolux

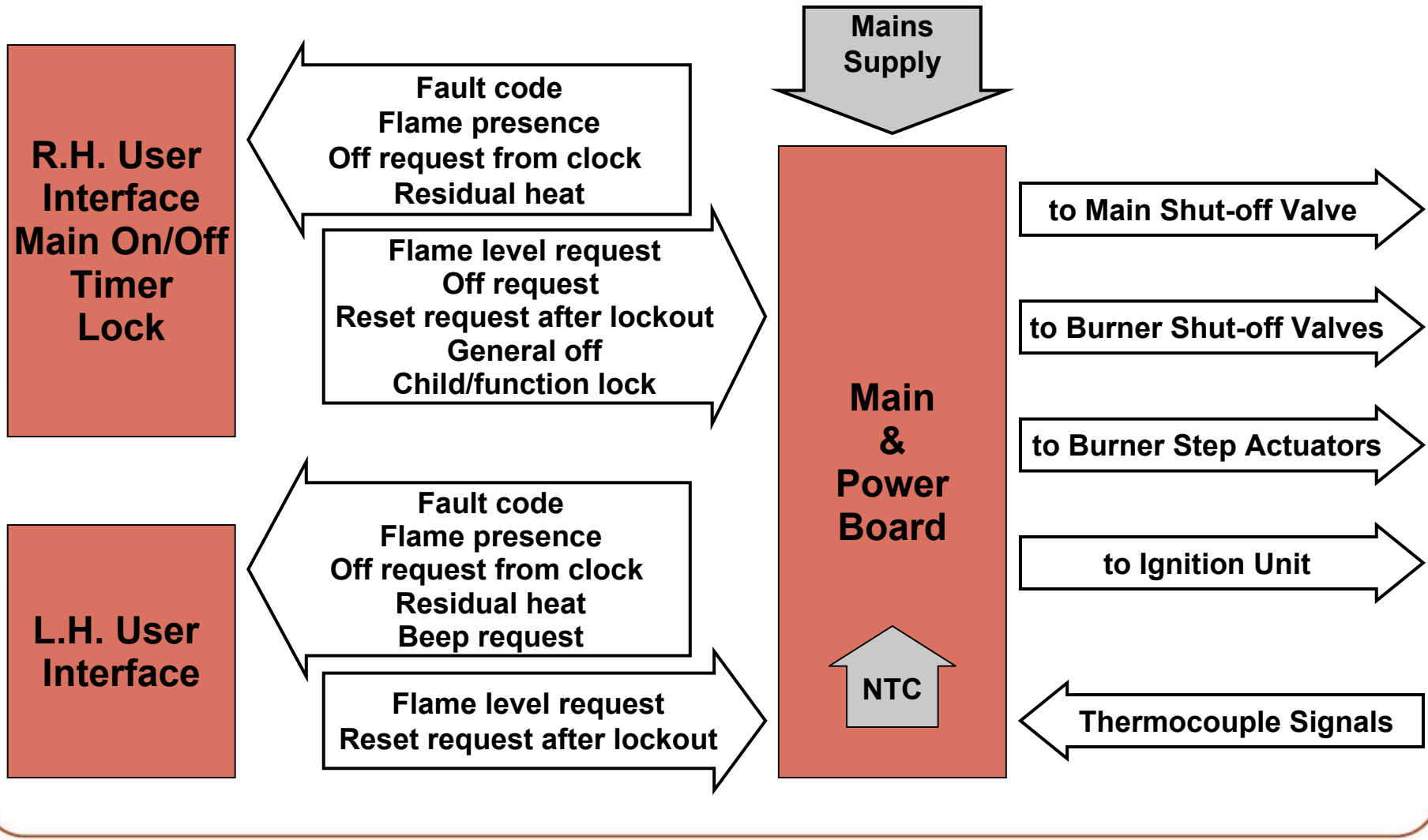
21	S	EEPROM memory fault
22	S	EEPROM data out of range
23	S	Software watchdog fault (time slot monitoring)
24	S	Logical monitoring tracing fault
		all above (15 to 24): Main board faulty
30	S	Uninstalled burner

Faulty PCB

Electrolux

- In case a fault of the electronic control is suspected, knowledge of the signal flow between the boards will be helpful to detect the faulty board
- Communication between the main board and each of the two user interface board is detailed on next slide

Communication PB - UI



Service Manual

Electrolux

Soon in TDS:

Service Manual

Publ. No. 599 366 262